



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

May 7, 2004

U.S. Army Corps of Engineers  
Regulatory Field Office  
P.O. Box 1890  
Wilmington, North Carolina 28402-1890

ATTN: Mr. Richard Spencer  
NCDOT Coordinator

Dear Mr. Spencer:

Subject: **Application for Section 404 and 401 Permits;** Hope Mills Bypass from SR 1141 (Bingham Drive) to SR 1363 (Elk Road), Cumberland County, Division 6, TIP No. U-0620, State Project No. 8.1442601, Federal Aid No. STP-0622(2), \$475.00 Debit work order 8.1442601, WBS Element 34408.1.1

The North Carolina Department of Transportation (NCDOT) proposes to construct a new facility, the Hope Mills Bypass, south of Fayetteville in Cumberland County, NC. The proposed project will widen existing George Owen Road (SR 1133) to a multi-lane facility from Bingham Drive (SR 1141) to Columbine Road (SR 3065) and extend on new location to intersect Legion Road (SR 1132) directly across from Elk Road (SR 1363). A four-lane divided facility with an 18-foot raised median is proposed for the new location section. The proposed project is approximately 3.75 miles in length. As of the date of this application, the project is scheduled for letting in September 2004.

This application package consists of the cover letter and ENG Form 4345 followed by appendices that include 8.5x11 permit drawings, bridge/culvert hydraulic design reports, the Stormwater Management Plan, Federal Emergency Management Agency compliance letter, Ecosystem Enhancement Program request letter, and the half size plan sheets.

Purpose and Need: As identified in the Environmental Assessment (EA), the proposed project will provide a circumferential route to facilitate travel around the southwest side of Fayetteville. It is the only circumferential facility planned in the Fayetteville Urban Area Thoroughfare Plan between the Outer Loop and the All-American Freeway. The Hope Mills Bypass is one element of a system-wide thoroughfare plan that provides travel between suburban growth areas, and is consistent with local land use plans. This project will be a major link of a southwestern looping corridor that allows developing

areas access to I-95 Business. By connecting the existing radial facilities (Cumberland Road, Camden Road, Legion Road, and I-95 Business), this project reduces the need for circuitous travel in southwestern Cumberland County.

Summary of Impacts: The proposed project will permanently impact 2.30 acres of bottomland hardwood forest wetlands and 1215 linear feet of jurisdictional streams. It will temporarily impact 0.36 acre of wetland and approximately 52 linear feet of stream.

Summary of Mitigation: The project has been designed to avoid and minimize impacts to jurisdictional areas in accordance with the National Environmental Policy Act (NEPA) and throughout the design process. The NCDOT proposes to utilize compensatory mitigation for unavoidable impacts via in-lieu payments to the North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP). A copy of the request letter is in Appendix F.

### **NEPA DOCUMENT STATUS**

The US Department of Transportation, Federal Highway Administration (FHWA) and NCDOT submitted an Environmental Assessment (EA) on September 9, 1998 in compliance with the NEPA guidelines. The document addressed U-0620 from SR 1141 (Bingham Drive) to SR 1363 (Elk Road). The EA explains the purpose and need for the project, provides a description of the alternatives considered, and characterizes the social, economic, and environmental effects. The EA was approved and circulated to federal, state, and local agencies. On January 31 2000, a Finding of No Significant Impact (FONSI) was approved. Copies of the EA and FONSI have been provided to regulatory review agencies involved in the approval process. Additional copies will be provided upon request.

### **INDEPENDENT UTILITY**

At the northern terminus of the project, U-620 will tie into Bingham Drive and Cumberland Road will connect to the Bypass with a “T” intersection. Fisher Road will also connect to the Bypass with a “T” intersection. At the southern terminus, improvements will be made to Elk Road for approximately 0.5 miles. These improvements will include providing a continuous right-turn lane along Elk Road from Legion Road to the Southview High school entrance.

U-0620 is in compliance with 23 CFR Part 771.111(f) which lists the FHWA characteristics of independent utility of a project:

- 1) the project has logical termini and independent utility and is of sufficient length to address environmental matters on a broad scope,
- 2) the proposed project is a reasonable expenditure of funds even if no other improvements are made;



- 3) further, the proposed project does not preclude reasonable alternatives for consideration as other projects are developed.

## RESOURCE STATUS

### Delineations:

Wetland and stream delineations were conducted in May/June 1998 by NCDOT personnel using the criteria specified in the 1987 Corps of Engineers Wetland Delineation manual. Mr. Dave Timpey of the US Army Corps of Engineers (USACE) Wilmington Regulatory Field Office verified the delineations in the field in the fall of 1998. A correspondence from Earth Tech, dated November 23, 2003, was sent to your attention, which provided the stream delineation forms for the project as well as an assessment of the wetland boundaries verified in 1998. During subsequent field visits by The Catena Group, additional jurisdictional impacts were identified and verified in the field by Mr. Richard Spencer of the US Army Corps of Engineers on March 3, 2004. Based on the information in this correspondence, NCDOT believes that all wetland and stream delineations are accurate and current and properly detailed in the attached permit drawings (Appendix A).

In addition to the delineations, the streams were characterized and the data recorded on both the NC Division of Water Quality (DWQ) Stream Classification forms and the USACE Intermittent Channel Evaluation Form. The following characterization of the jurisdictional sites summarizes the May 1998 Natural Systems Report including data from the aforementioned forms.

### Wetlands:

The primary wetland community type is Coastal Plain Bottomland Hardwoods (blackwater subtype). All of the wetlands impacted by the proposed project are riverine. This community is primarily composed of red maple (*Acer rubrum*), black gum (*Nyssa sylvatica*), and sweet gum (*Liquidambar styraciflua*), with some tulip poplar (*Liriodendron tulipifera*), loblolly pine (*Pinus taeda*), and pond pine (*Pinus serotina*). A dense shrub layer is often present. These wetlands are defined by Cowardin as palustrine, forested, broad-leaved deciduous systems characterized by seasonal flooding (PFO1C). There are no impacts to ponds.

### Streams:

The project corridor is located within DWQ sub-basin 03-06-15 of the Cape Fear River Basin. Seven perennial streams are crossed by the project, all of which are within US Geological Survey (USGS) Cataloging Unit 03030004 and eventually drain into Hope Mills Lake, which is situated south of the alignment. Hope Mills Lake is not a water supply lake. All streams are low gradient coastal plain streams. Beaver Creek (Site 1A) and Buckhead Creek (Site 2) are the larger named streams in the project corridor and have active floodplains with well-defined levees. As of January 12, 2004, both Beaver Creek and Buckhead Creek have a DWQ Best Usage Classification of C, which indicates waters protected for secondary recreation, fishing, wildlife, fish and aquatic life

propagation and survival, agriculture and other uses suitable for Class C. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner. There are no restrictions on watershed development or types of discharges for Class C waters. Sites 5 and 6, which are perennial streams near the backwaters of Hope Mills Lake, have a DWQ Best Usage Classification of B. Class B waters are those used for primary recreation and other uses suitable for Class C. Primary recreation includes swimming, skin diving, water skiing, and similar uses involving human body contact with water where such activities take place in an organized manner or on a frequent basis. While there are no restrictions on watershed development for Class B waters, discharges must meet treatment reliability requirements such as backup power supplies and dual train design. As of January 6, 2004, none of the water resources are designated as biologically impaired water bodies regulated under the provisions of the CWA §303(d).

### Impacts

Impacts to jurisdictional wetlands and surface waters are summarized in Table 1 as well as sheet 25 of 27 of the permit drawings. Wetlands will be impacted at 6 separate sites for a total of 2.30 acres of permanent impacts, which includes fill, excavation, and mechanized clearing in wetlands. There will be impacts at 6 stream crossings for a total of 1215 linear feet of channel impacts. There will also be 0.20 acre of wetlands temporarily impacted at Site 5 to construct a bridge, as well as 52 linear feet of temporary channel impacts and 0.16 acre temporary wetland impacts associated with a temporary detour at Site 7 to allow for the replacement of an existing culvert, as shown in Table 2. These impacts are described in detail in the minimization section of the application (page 9).

Table 1. Permanent Jurisdictional Impacts

<b>SITE</b>	<b>Waterbody</b>	<b>Wetlands (ac)</b>	<b>Streams (ft)</b>	<b>DWQ Classification</b>	<b>DWQ Index Number</b>
1A*	Beaver Creek	0	0	C	18-31-24-5
1B	UT to Beaver Creek "Beaver Ck Trib A"	0.77	202	C	18-31-24-5
2	Buckhead Creek	0	280	C	18-31-24-6
3	UT to Buckhead Creek	0.82	334	C	18-31-24-6
4	UT to Buckhead Creek	0.14	0	C	18-31-24-6
5	UT to Little Rockfish Creek	0.15	0	B	18-31-24-(6.5)
6	UT to Little Rockfish Creek	0.39	259	B	18-31-24-(6.5)
7	UT to Beaver Creek "Beaver Ck Trib B"	0.03	78	C	18-31-24-5
7A	UT to Beaver Creek "Beaver Ck Trib B"	0	62	C	18-31-24-5
<b>Totals:</b>		<b>2.30</b>	<b>1215</b>		

\* Although no impacts incurred, Site 1A included per agency request for bridge design review.

Table 2. Temporary Jurisdictional Impacts

SITE	Waterbody	Wetlands (ac)	Streams (ft)	DWQ Classification	DWQ Index Number
5	UT to Little Rockfish Creek	0.20	0	B	18-31-24-(6.5)
7A	UT to Beaver Creek "Beaver Ck Trib B"	0.16	52	C	18-31-24-5
	<b>Totals:</b>	<b>0.36</b>	<b>52</b>		

### FEDERALLY PROTECTED SPECIES

Plants and animals with federal classification of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of January 29, 2003 the US Fish and Wildlife Service (USFWS) lists eight federally protected species for Cumberland County (Table 3).

Table 3. Federally Protected Species in Cumberland County

Common Name	Scientific Name	Federal Status	Biological Conclusion
American alligator	<i>Alligator mississippiensis</i>	T (S/A)	NA
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	No Effect
Saint Francis' satyr	<i>Neonympha mitchellii francisci</i>	E	No Effect
Small whorled pogonia	<i>Isotria medeoloides</i>	T	May Affect – Not Likely to Adversely Affect
Pondberry	<i>Lindera melissifolia</i>	E	May Affect – Not Likely to Adversely Affect
Rough-leaved loosestrife	<i>Lysimachia asperulaefolia</i>	E	May Affect – Not Likely to Adversely Affect
Michaux's sumac	<i>Rhus michauxii</i>	E	May Affect – Not Likely to Adversely Affect
American chaffseed	<i>Schwalbea americana</i>	E	No Effect
E= a species that is in danger of extinction throughout all or a significant portion of its range. T= a species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. T(S/A) = a species likely to become endangered in the foreseeable future throughout all or a significant portion of its range.			

Biological conclusions of either "No Effect" or "May Affect – Not Likely to Adversely Affect" were reached for all species based on on-site surveys made in March, April, and June 1998. The surveys indicated that no habitat for the red-cockaded woodpecker, Saint Francis' satyr butterfly, or American chaffseed is present within the project boundaries. Potential habitat for small whorled pogonia, pondberry, rough-leaved loosestrife, and

Michaux's sumac is present. However, plant-by-plant surveys for these species did not reveal the presence of any of these species within the project boundaries. The USFWS concurred with these findings in a letter to NCDOT dated December 23, 1998, which is included in the EA/FONSI. Plant-by-plant surveys for rough-leaved loosestrife and Michaux's sumac were performed again on October 10, 2001. Once again, no plants of either species were found on the project. The biological conclusions of May Affect – Not Likely to Adversely Affect for these species are currently expired. Through the submittal of this application, NCDOT has committed to re-survey in appropriate habitat during appropriate survey windows for small whorled pogonia, pondberry, rough-leaved loosestrife, and Michaux's sumac before project construction.

### **INDIRECT AND CUMMULATIVE IMPACT ANALYSIS**

From the Qualitative Indirect and Cumulative Effects (ICE) Assessment completed on December 19, 2003 by HNTB and reviewed with personnel from the DWQ on January 23, 2004, it was concluded that, while U-0620 will accelerate development in the vicinity, environmental regulations are expected to minimize any potential deterioration to water quality.

The ICE Assessment was submitted to the agencies on December 31, 2003. Additional copies of the ICE Assessment are available upon request.

### **UTILITY IMPACTS**

No utility impacts are anticipated from construction of this project. However, there is a possibility that the existing water line crossing the UT to Beaver Creek (Site 7) may have to be re-aligned. This will depend upon the depth of the existing water line in relation to the bottom of the new culvert. If it is determined that there will be insufficient separation between the two, then the water line will be re-aligned slightly upstream of the project as shown in permit drawing sheet 24 of 27 and on the Utility Construction Plan sheet which is included with the half size plan sheets.

If the re-alignment is necessary, then an open cut of the creek will be utilized for installation. This will entail a temporary dam or water diversion being installed, after which the creek will be cut to allow for placement of the water line a minimum of 1.5 feet under the creek bottom. The proposed water line will be made of 16" ductile iron. There will be no joints below the creek. The process is expected to be completed in one day. The creek will then be restored to its pre-existing condition.

A directional bore was not considered a viable option for this location due to high costs (in excess of \$30,000 at this location alone) and the difficulty of boring from high ground to high ground with no planned joints in the pipe below the creek. Other considerations that were factored into the decision to utilize and open cut is that there is going to be considerable disturbance in the creek when removing culvert pipes and installing new

temporary diversion pipes. These disturbances will require a temporary diversion for a temporary crossing. If the re-alignment is necessary, it will be completed at the same time as these other disturbances.

## **CULTURAL RESOURCES**

As stated in the EA, there are no known structures of historical or architectural importance within the project corridor. A total of 13 archaeological sites were documented within or near the project alignments. Eleven of these sites were determined to be insignificant archaeological resources, so no additional investigation was recommended. The remaining two sites are located outside the impact area and no additional investigation was recommended. The State Historic Preservation Office (SHPO) concurred with these findings in a letter dated May 29, 1998 (Appendix A of the Environmental Assessment).

## **WILD AND SCENIC RIVERS**

Two named streams and five unnamed tributaries are crossed by the proposed project. The project will not impact any Designated Wild and Scenic Rivers or any other rivers included in the list of study rivers (Public Law 90-542, as amended).

## **FEMA COMPLIANCE**

The project impacts three streams that are subject to FEMA compliance. The first is Beaver Creek Tributary B located at Station Y2 15+47 to 16+00 (Site 7). At this location, a 66-inch by 55-inch corrugated metal pipe is to be replaced by a 9-foot by 5-foot concrete box culvert. The second is Beaver Creek located at Station L 32+00 (Site 1), which is proposed to be bridged. In-kind replacement is being pursued for Site 1. The third is Buckhead Creek (Site 2) located from L 105+83 to 106+95. The proposed culvert will consist of two 10-foot by 13-foot culverts. Floodway revisions have been performed at the crossing of Buckhead Creek. The NCDOT Hydraulics Unit has coordinated the floodway revisions with FEMA and the resulting concurrence letter is included in Appendix D.

## **ESSENTIAL FISH HABITAT/ AQUATIC LIFE MOVEMENT STATUS**

While no Essential Fish Habitat is present in the project corridor, NCDOT is committed to ensure that the project will have no disturbance to aquatic life movements. Structures impacting waters on the project will be designed to ensure fish and other aquatic life passage.

## MITIGATION OPTIONS

The USACE has adopted, through the Council on Environmental Quality (CEQ), a wetland mitigation policy that embraces the concept of “no net loss of wetlands” and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of the Waters of the United States. Mitigation of wetland and surface water impacts has been defined by the CEQ to include avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts (40 CFR 1508.20). Executive Order 11990 (Protection of Wetlands) and US Department of Transportation Order 5660.1A (Preservation of the Nation’s Wetlands), emphasize protection of the functions and values provided by wetlands. These directives require that new construction in wetlands be avoided as much as possible and that all practicable measures are taken to minimize or mitigate impacts to wetlands.

**NEPA Commitments:** Specific Environmental Commitments developed by the NEPA process are outlined in the EA and expanded upon in the FONSI where they appear on “green sheets”. Many of these commitments are standard operating procedures, and are noted as such in the FONSI. The other commitments specific to this project are detailed and the status of the commitment noted in italics below.

- The NCDOT Hydraulics Unit will coordinate with the FEMA and local authorities during final design to process the floodway revision and ensure compliance with applicable floodplain ordinances. Floodway revisions are anticipated to be needed for crossing of Beaver Creek, Beaver Creek Tributary B, and Buckhead Creek.  
*See FEMA Compliance Section of Cover Letter.*
- Efforts will be made during design to further reduce impacts to a wetland near the CSX Railroad on Alternate 1. These minimization efforts will be coordinated with the resource agencies early in the preliminary design process.  
*See Minimization – Site 5 Section of Cover Letter*
- The NCDENR, Division of Parks and Recreation recommend mitigation consisting of protecting a nearby tract of wet pine flatwoods. No wet pine flatwoods have been identified in the project area however, this will be evaluated in more detail during the design phase.  
*NCDOT has opted to provide mitigation via in-lieu payments to the EEP. They will request that EEP consider the Division of Parks and Recreation request when providing said mitigation.*
- WRC recommends installing a level spreader into wetland areas to aid in filtering stormwater runoff. Project Development along with Roadway Design will work with the Hydraulics Unit to develop stormwater drainage plans. A series of alternates for handling runoff will be developed for the proposed project. Drainage Plans will be forwarded to resource agencies once they are completed.

*Drainage plans were reviewed with agency personnel during a meeting on August 22, 2002. Additional changes have been incorporated since that meeting and are detailed in the attached permit drawings and half-size plan sheets.*

- NCDOT is committed to providing mitigation for unavoidable impacts. The mitigation will be developed in coordination with resource agencies during the preliminary design process.  
*NCDOT is providing mitigation via in-lieu payments to the EEP.*

**AVOIDANCE AND MINIMIZATION:** The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

**Avoidance:** Early in the project study, the Thoroughfare Plan alignment was the only alternate studied for the project. A preliminary field investigation conducted to determine wetland areas and potential for impacts revealed substantial impacts to high quality wetlands. To avoid impacts to high quality wetlands by the Thoroughfare Plan alignment, Alternates 1 and 2 were developed on the new location portion of the project and the original alignment abandoned.

**Minimization:** NCDOT employs many strategies to minimize impacts to jurisdictional areas in all of its designs. Many of these strategies have been incorporated into Best Management Practices (BMPs) documents that have been reviewed and approved by the resource agencies and which will be followed throughout construction. The project design was reviewed with resource agency personnel in a meeting on August 22, 2002, in what constituted a 4C Merger Meeting. The minutes of this meeting are included in Appendix B. During the meeting, possible strategies to further minimize impacts were discussed. Listed below are the general strategies and BMPs that are particularly pertinent to this project as well as a summary of the avoidance and minimization measures implemented at each individual site.

#### General Strategies

- In addition to utilizing existing alignments, crossings of jurisdictional areas were angled to cross as perpendicular as possible to minimize impacts.
- All fill slopes in jurisdictional areas will be 2:1.
- All right-of-way fences placed in wetlands will be hand cleared to the minimum width required for construction.
- The bridge/culvert report for each crossing is included in Appendix C to assist resource agency personnel in reviewing the plans

- The details of the preformed scour holes detailed in the Site Specific Strategies below are on sheet 2-G of the attached half-sized planning sheets
- Enhanced grass swales with permanent check dams will be utilized where appropriate in order to filter runoff and dissipate velocities in the major drainage outfalls (see Stormwater Management Plan in Appendix E for further detail).

### Site Specific Strategies

Site 1A. In accordance with the request from the 4C meeting, a permit drawing has been included (sheet 3 of 27) that reflects no jurisdictional impacts and the placement of riprap along the embankment.

The existing bridge is a cored slab on steel H-piles. The bridge will be demolished by first removing the asphalt and cored slabs. Once the deck is removed, the piles will either be pulled out of the substrate or cut off at ground level. The maximum potential fill is 25 cubic yards. While extremely unlikely, if any portion of the bridge falls into the stream during demolition, the temporary fill will be immediately (same day) removed.

Site 2. NCDOT will install two 72-inch pipes to convey high event stormwater flows under the road (sheet 7 of 27), thus alleviating flooding concerns.

Site 3. NCDOT proposes to re-establish the previous flow pattern that was altered due to a recent sewer line installation. The limits of the site have been expanded to show the proposed stream crossing. Mr. Kenneth Averitte of the DWQ Fayetteville Regional Office, along with Richard Spencer (USACOE) visited this site on March 3, 2004. The alteration to the sites hydrology due to the installation of a sewer line was reviewed along with the proposed design to restore the area. Both representatives agreed with the proposed design and Mr. Averitte noted he would investigate the alterations that occurred from installation of the sewer line.

Site 4. An energy dissipator basin has been placed at the outlet of the 30" RCP (sheet 14 of 27) and a preformed scour hole has been placed at the outlet of the 18" RCP right of -L- Sta. 150+30 (sheet 13 of 25).

Site 5. The proposed bridge span and alignment was revised to reduce the wetland impacts by 1.58 acres. In order to construct the bridge, temporary timber mats will be required resulting in temporary wetland impacts of 0.20 acre. The mats are anticipated to be in place for 18 months beginning approximately 1 month after the start of construction. Upon completion of the bridge, the mats will be removed and the area allowed to re-vegetate naturally. This is not anticipated to



cause a problem since there are no channels in the area that will cause excessive erosion of the temporarily disturbed section.

Two preformed scour holes will be installed near Site 5 as well as an energy dissipator. They are shown in permit drawings sheets 17 and 18 of 27.

- Site 6. As requested in the 4C meeting, cross section plots at the upstream face, centerline, and downstream face are included in the bridge/culvert reports in Appendix B. NCDOT will incorporate cross vanes if deemed necessary by the resource agencies.

As detailed in the drawings, a 36-inch overflow pipe will be installed to facilitate the passage of water during periods of high flow.

- Sites 7 and 7A. The existing 66" x 51" corrugated steel-arched pipe will be removed and replaced with a 9' x 5' reinforced concrete box culvert. This improvement will necessitate an on-site detour with a temporary crossing of the stream (sheet 23 of 27). The temporary fill will consist of Class I riprap. The crossing is anticipated to be in place for 10 months beginning approximately 1 month after the start of construction. No permanent fill will result from the subject activity. All material used in the construction of the temporary causeway, including the 51" by 66" corrugated steel-arched pipe, will be removed. Profiles and cross-sections of the streambed have been measured, including location of the stream thalweg. The NCDOT will restore the stream to its pre-project contours and elevations. The soil in this wetland is mineral, therefore little compaction is anticipated from the construction activities.

TEMPORARY IMPACTS: Construction of -Y2- and the temporary detour - Y2DET- for Site 7/Site 7A will require the installation of one 9 ft. by 5 ft. Reinforced Concrete Box Culvert (RCBC) and one 51 inch by 66 inch Corrugated Arched Pipe (CAP), respectively. The CAP will be installed while the stream flow is diverted through a pumping operation. The Contractor shall utilize pump(s) of a size and number sufficient to maintain a dry work area. The stream water that is diverted through the pump(s) shall be released into an area of existing vegetation sufficient to allow the water to be filtered and flow at a controlled rate back into the stream downstream of the pipes. The CAP construction area will be sealed off by a combination of materials that will be selected during the construction of the project in order to minimize the temporary impacts. Traditional methods include, sheet piling, sandbags, concrete traffic barrier or soil encased in fabric. The initial phase of the RCBC construction will have impervious dikes installed upstream and downstream of the RCBC location. A temporary channel change with liner will be constructed to divert the stream flow around the work area. If necessary, the RCBC and/or CAP construction area will be dewatered by pumping into a stilling basin before the effluent is released back into the existing stream.

Restoration Plan: The area impacted by the temporary detour will be restored to pre-project conditions and contours following the completion of the permanent structure and roadway. The impacted areas will be revegetated according to the reforestation plan and seeding & mulching mix included in the Erosion Control plans and special provisions.

Schedule: All steps will be taken to minimize stream impacts for the Beaver Creek Tributary B. NCDOT will request the Contractor to complete the construction of the temporary detour in a timely manner so that all exposed areas will be stabilized to prevent erosion. The project schedule calls for a production letting of September 21, 2004 with a date of availability of October 26, 2004. It is expected that the Contractor will choose to start construction of the temporary detour at that time.

Removal and Disposal Plan: The Contractor will be required to submit a reclamation plan for the removal of and disposal of all materials off-site at an upland location. The Contractor will use excavating equipment to remove any materials from the stream. Heavy-duty trucks, dozers, cranes and various other pieces of mechanical equipment necessary for construction of roadways and culverts will be used on site. All material placed in the stream will be removed at that time. The Contractor will have the option of reusing any of the materials that the Engineer deems suitable in the construction of the project. After the impervious dikes are no longer needed, all materials will become the property of the Contractor.

NCDOT evaluated placing the detour upstream of the existing road. However, the potential flooding conditions to structures (houses) upstream of the crossing would have been greatly increased due to higher overtopping profile of the roadway. In addition, while the amount of wetlands impacted by a crossing downstream is greater than that upstream, the upstream wetlands are of a higher quality and provide a better riparian buffer than those downstream.

**COMPENSATION:** The primary emphasis of the compensatory mitigation is to reestablish a condition that would have existed if the project were not built. As previously stated, mitigation is limited to reasonable expenditures and practicable considerations related to highway operation. Mitigation is generally accomplished through a combination of methods designed to replace wetland functions and values lost as a result of construction of the project. These methods consist of creation of new wetlands from uplands, borrow pits, and other non-wetland areas; restoration of wetlands; and enhancement of existing wetlands. Where such options may not be available, or when existing wetlands and wetland-surface water complexes are considered to be important resources worthy of preservation, consideration is given to preservation as at least one component of a compensatory mitigation proposal.

**FHWA STEP DOWN COMPLIANCE:** All compensatory mitigation must be in compliance with 23 CFR Part 777.9, "Mitigation of Impacts", which describes the actions that should be followed to qualify for Federal-aid highway funding. This process is known as the FHWA "Step Down" procedures:

1. Consideration must be given to mitigation within the right-of-way and should include the enhancement of existing wetlands and the creation of new wetlands in the highway median, borrow pit areas, interchange areas and along the roadside.
2. Where mitigation within the right-of-way does not fully offset wetland losses, compensatory mitigation (enhancement, creation, and/or preservation) may be conducted outside the right-of-way including.

Based upon the agreements stipulated in the "Memorandum of Agreement Among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the US Army Corps of Engineers, Wilmington District" (MOA), it is understood that the EEP will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for NCDOT projects that are listed in Exhibit 1 of the subject MOA during the EEP transition period which ends on June 30, 2005.

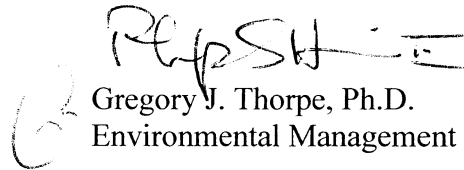
Because the subject project is listed in Exhibit 1, the necessary compensatory mitigation to offset unavoidable impacts to waters that are jurisdictional under the federal Clean Water Act will be provided by the EEP. The offsetting mitigation will derive from an inventory of assets already in existence within the same 8-digit USGS cataloging unit. The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The remaining, unavoidable impacts to 2.30 acres of jurisdictional wetlands and to 1215 linear feet of jurisdictional streams will be offset by compensatory mitigation provided by the EEP program. A copy of the request letter sent to the EEP on May 4, 2004 is included in Appendix F of this application.

### **REGULATORY APPROVALS**

Application is hereby made for a Department of Army Individual 404 Permit as required for the above-described activities. We are also requesting a 401 Water Quality Certification from the Division of Water Quality. In compliance with Section 143-215.3D(e) of the NCAC, we will provide \$475.00 to act as payment for processing the Section 401 permit application previously noted in this application (see Subject line). We are providing seven copies of this application to the NC Department of Environment and Natural Resources (NCDENR), Division of Water Quality (DWQ), for their review.

If you have any questions or need additional information, please call Mr. Matt Haney, Environmental Specialist at 919-715-1428.

Sincerely,

A handwritten signature in black ink, appearing to read "Gregory J. Thorpe".

Gregory J. Thorpe, Ph.D.  
Environmental Management Director, PDEA Branch

GJT/mh

cc: Mr. David Franklin, USACE, Wilmington (Cover Letter Only)  
Mr. John Hennessy, NCDENR, Division of Water Quality (7 copies)  
Mr. Travis Wilson, NCWRC  
Ms. Becky Fox, USEPA  
Mr. Gary Jordan, USFWS, Raleigh  
Mr. William D. Gilmore, P.E., EEP, Raleigh  
Mr. John Sullivan, FHWA  
Mr. Jay Bennett, P.E., Roadway Design Unit  
Mr. Omar Sultan, Programming and TIP  
Mr. Art McMillan, P.E., Highway Design Branch  
Mr. David Chang, P.E., Hydraulics Unit  
Mr. Greg Perfetti, P.E., Structure Design Unit  
Mr. Mark Staley, Roadside Environmental  
Mr. Terry Gibson, P.E., Division 6 Engineer  
Mr. Jim Rerko, Division 6 Environmental Officer  
Mr. Michael Wood, The Catena Group

**APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT  
(33 CFR 325)**

**OMB APPROVAL NO. 0710-003  
Expires December 31, 2004**

Public reporting burden for this collection of information is estimated to average 10 hours per response, although the majority of applications should require 5 hours or less. This includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

**PRIVACY ACT STATEMENT**

Authority: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research and Sanctuaries Act, 33 USC 1413, Section 103. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

**(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)**

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED
--------------------	----------------------	------------------	-------------------------------

**(ITEMS BELOW TO BE FILLED BY APPLICANT)**

5. APPLICANT'S NAME North Carolina Department of Transportation Project Development & Environmental Analysis	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)  N/A
6. APPLICANT'S ADDRESS  1548 Mail Service Center Raleigh, NC 27699-1548	9. AGENT'S ADDRESS  N/A
7. APPLICANT'S PHONE NOS. W/AREA CODE a. Residence b. Business 919-715-1335	10. AGENT'S PHONE NOS. W/AREA CODE a. Residence b. Business

**11. STATEMENT OF AUTHORIZATION**

I hereby authorize, \_\_\_\_\_ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

APPLICANT'S SIGNATURE

DATE

**NAME, LOCATION, AND DESCRIPTION OR PROJECT OR ACTIVITY**

12. PROJECT NAME OR TITLE (see instructions) Hope Mills Bypass from SR 1141 (Bingham Drive) to SR 1132 (Legion Road), Hope Mills, Cumberland County, TIP Project No. U-0620	14. PROJECT STREET ADDRESS (if applicable)
13. NAME OF WATERBODY, IF KNOWN (if applicable) Buckhead Creek and tributaries Beaver Creek and tributaries tributaries to Little Rockfish Creek	
15. LOCATION OF PROJECT Cumberland COUNTY NC STATE	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) Section, Township, Range, Lat/Lon, and/or Accessors's Parcel Number, for example.

**17. DIRECTIONS TO THE SITE**

From I-95 south take exit 41 (NC 59) west. Follow NC 59 about 5.5 miles to Cumberland Road. Turn left onto Cumberland Road and go about 0.5 miles. Cumberland Road turns into Bingham Drive at intersection of Fisher Road. Project begins just to the northwest of this location on Bingham Drive.

18. Nature of Activity (Description of project, include all features)

The North Carolina Department of Transportation (NCDOT) proposes to construct a new facility, the Hope Mills Bypass. The proposed project will widen existing George Owen Road (SR 1133) to a multi-lane facility from Bingham Drive (SR 1141) to Columbine Road (SR 3065) and extend on new location to intersect Legion Road (SR 1132) directly across from Elk Road (SR 1363). A four-lane divided facility with an 18-foot (5.4 m) raised median is proposed for the new location section. The proposed action is about 3.7 miles in length.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

Public transportation; to improve traffic flow and increase safety. See Cover Letter for Purpose and Need.

**USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED**

20. Reason(s) for Discharge

Highway Fill

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards

See attached application and summary sheet for details

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Impacts on jurisdictional areas of the proposed project consist of the following: a total of 2.30 acres of permanent impacts, which includes fill, excavation, and mechanized clearing in wetlands, 0.36 acres temporary wetland impacts. In addition, there will be 1215 linear feet of existing channel impacted and 0.005 acres temporary fill in surface waters.

See permit drawings for wetland and surface water impacts by site.

23. Is Any Portion of the Work Already Complete? Yes \_\_\_ No X IF YES, DESCRIBE THE COMPLETED WORK

24. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (If more than can be entered here, please attach a supplemental list).

See attached Permit Drawings for a list of Landowners.

25. List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
--------	---------------	-----------------------	--------------	---------------	-------------

\* Would include but is not restricted to zoning, building, and flood plain permits

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT

DATE

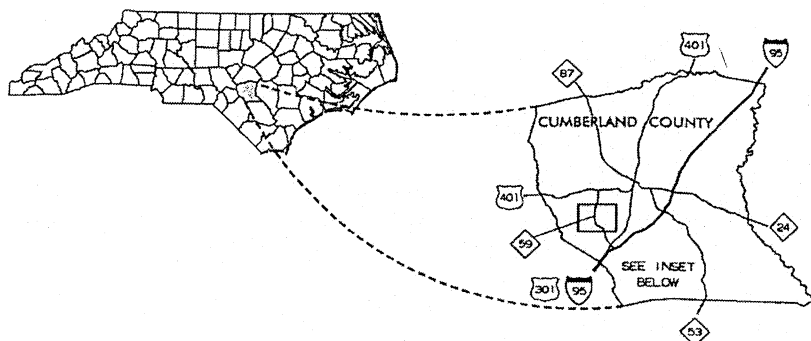
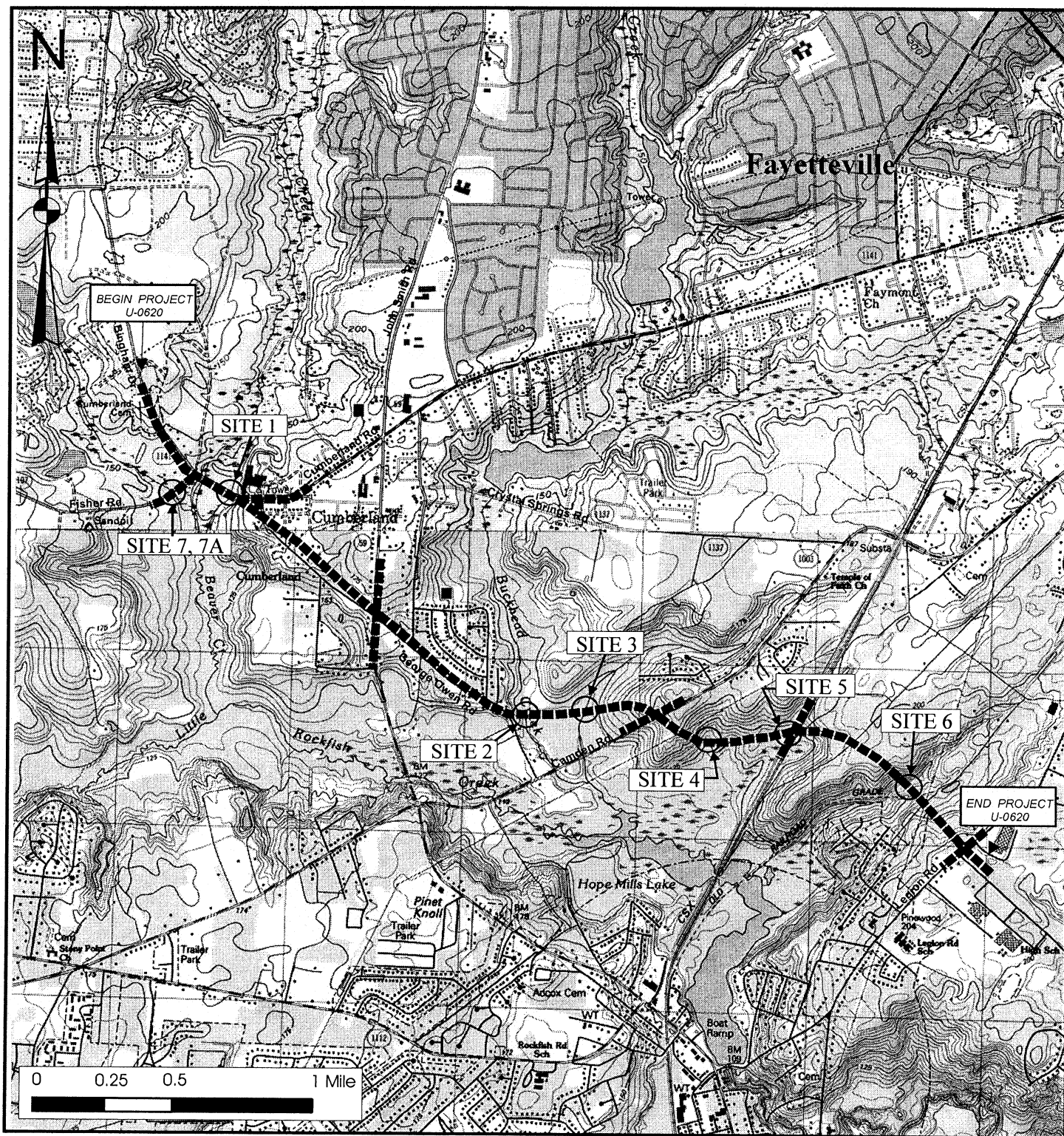
SIGNATURE OF AGENT

DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

**APPENDIX A**  
**Permit Drawings**



N.C. DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

PROJECT: 8.1442601 (U-0620)  
HOPE MILLS BYPASS  
FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

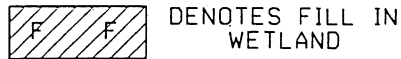
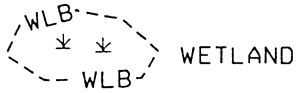
SHEET 1 OF 27

03/08/02



# WETLAND LEGEND

--- WLB --- WETLAND BOUNDARY



DENOTES FILL IN WETLAND



DENOTES FILL IN SURFACE WATER



DENOTES FILL IN SURFACE WATER (POND)



DENOTES TEMPORARY FILL IN WETLAND



DENOTES EXCAVATION IN WETLAND



DENOTES TEMPORARY FILL IN SURFACE WATER



DENOTES MECHANIZED CLEARING

— BZ — RIPARIAN BUFFER ZONE

← ← FLOW DIRECTION

— TB — TOP OF BANK

— WE — EDGE OF WATER

— C — PROP. LIMIT OF CUT

— F — PROP. LIMIT OF FILL

▲ PROP. RIGHT OF WAY

— NG — NATURAL GROUND

— PL — PROPERTY LINE

— TDE — TEMP. DRAINAGE EASEMENT

— PDE — PERMANENT DRAINAGE EASEMENT

— EAB — EXIST. ENDANGERED ANIMAL BOUNDARY

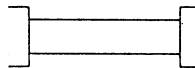
— EPB — EXIST. ENDANGERED PLANT BOUNDARY

— ∇ — WATER SURFACE

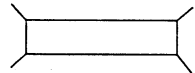
X X X LIVE STAKES

BOULDER

— COIR FIBER ROLLS



PROPOSED BRIDGE



PROPOSED BOX CULVERT

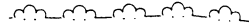


PROPOSED PIPE CULVERT

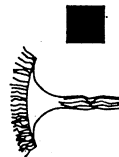
(DASHED LINES DENOTE EXISTING STRUCTURES)



SINGLE TREE



WOODS LINE



DRAINAGE INLET



ROOTWAD



RIP RAP



ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE

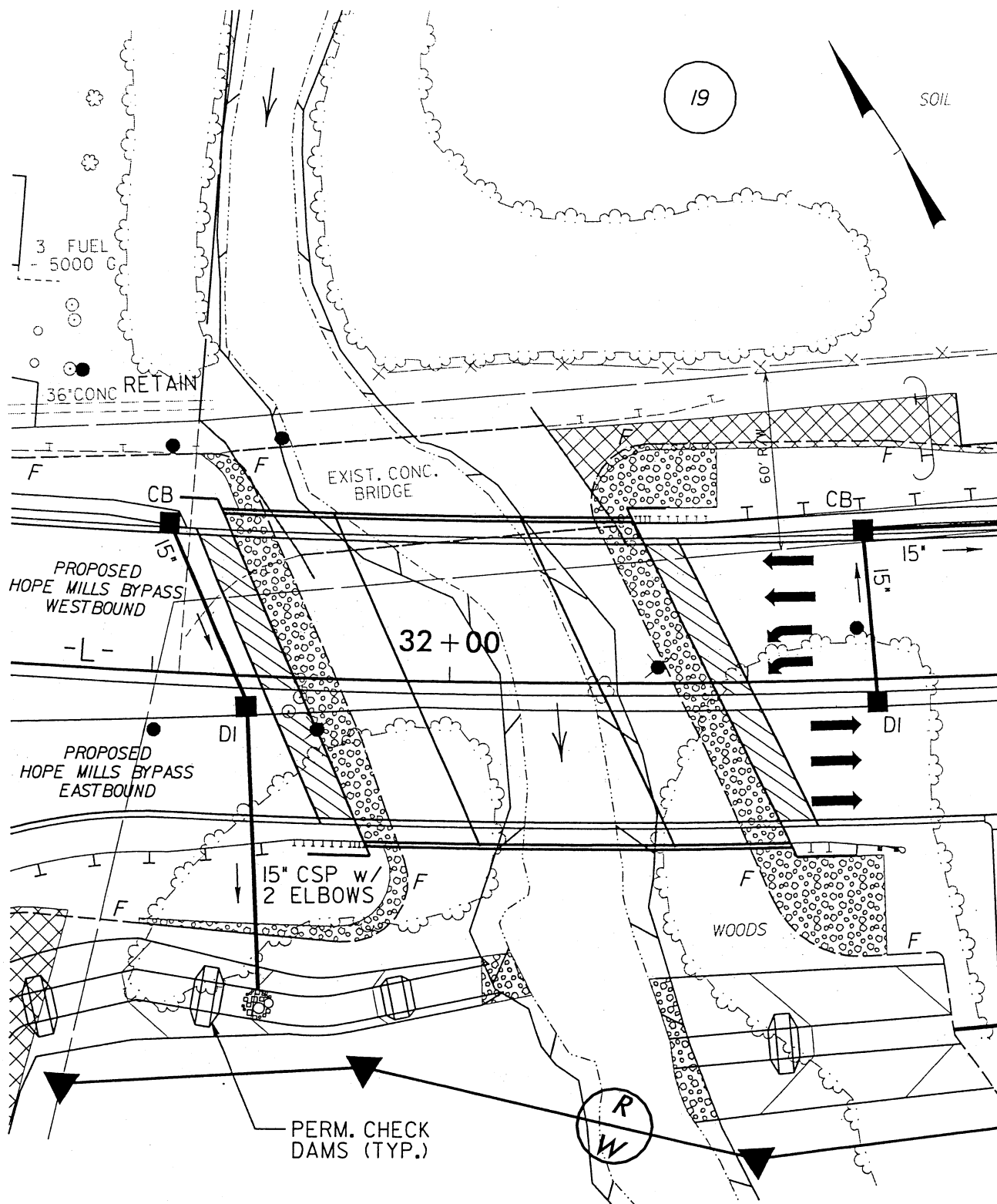
N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

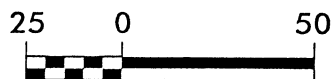
PROJECT: 8.1442601 (U-0620)  
HOPE MILLS BYPASS  
FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

SHEET 2 OF 27

01/21/03



PLAN VIEW  
SITE 1A



N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

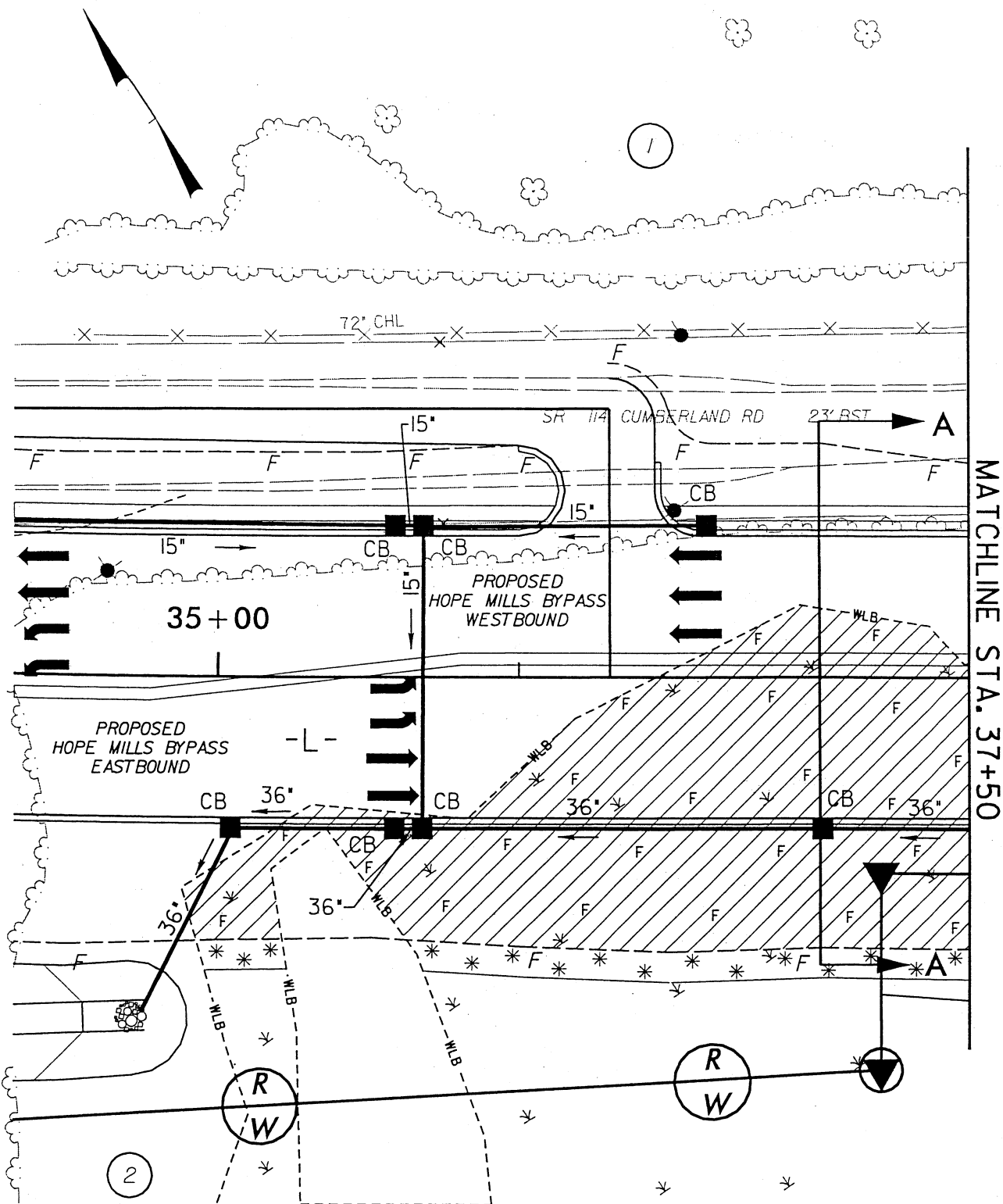
CUMBERLAND COUNTY

PROJECT: 8.1442601 (U-0620)  
HOPE MILLS BYPASS  
FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

SHEET 3 OF 27

01/21/03

REVISED 2/3/04



# PLAN VIEW SITE 1B



DENOTES MECHANIZED  
CLEARING



DENOTES FILL IN  
WETLANDS



N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

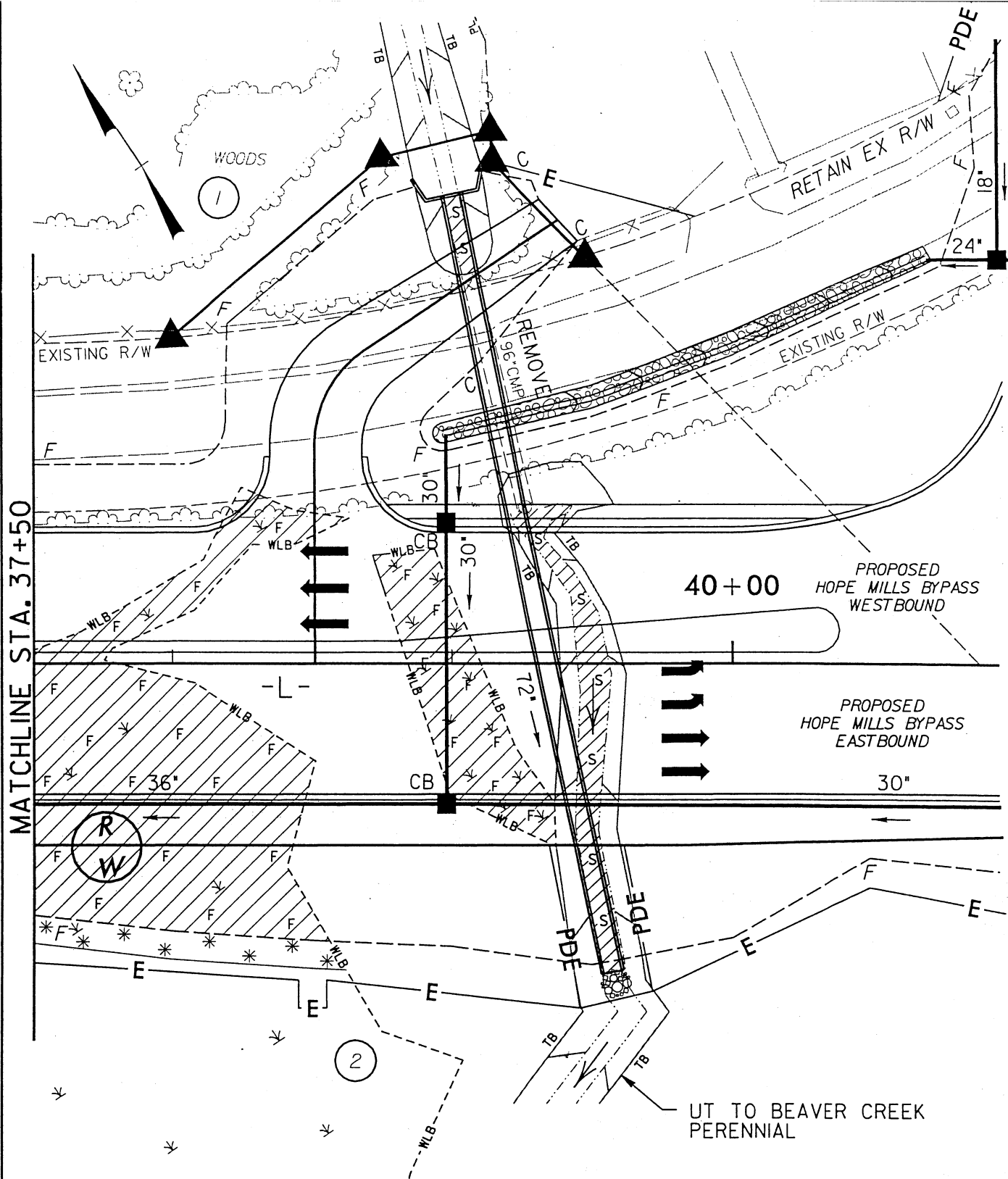
CUMBERLAND COUNTY

PROJECT: 8.1442601 (U-0620)  
HOPE MILLS BYPASS  
FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

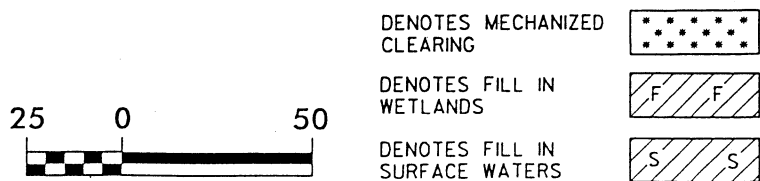
SHEET 4 OF 27

01/21/03

REVISED 4/15/04



# PLAN VIEW SITE 1B



N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

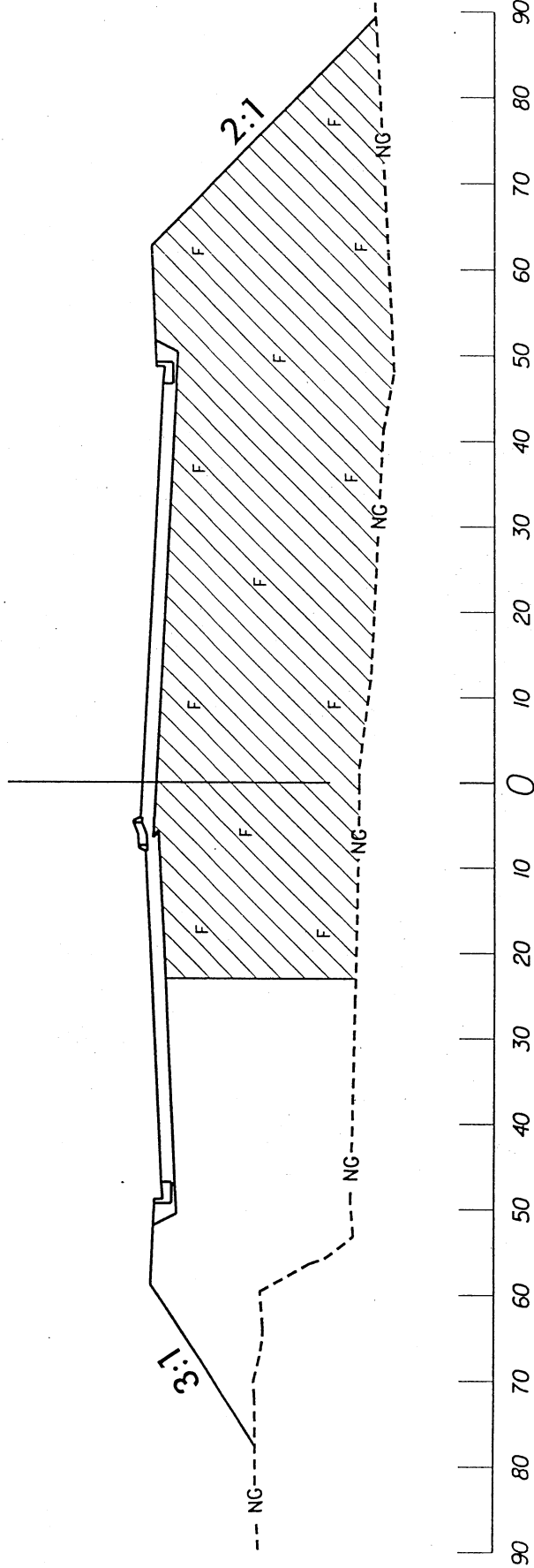
PROJECT: 8.1442601 (U-0620)  
HOPE MILLS BYPASS  
FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

SHEET 5 OF 5

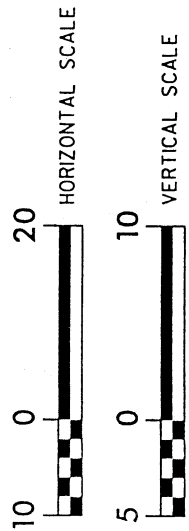
01/21/03

REVISED 4/15/04

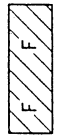
37+00 -L-



# SITE 1 SECTION A-A



DENOTES FILL IN  
WETLANDS



N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

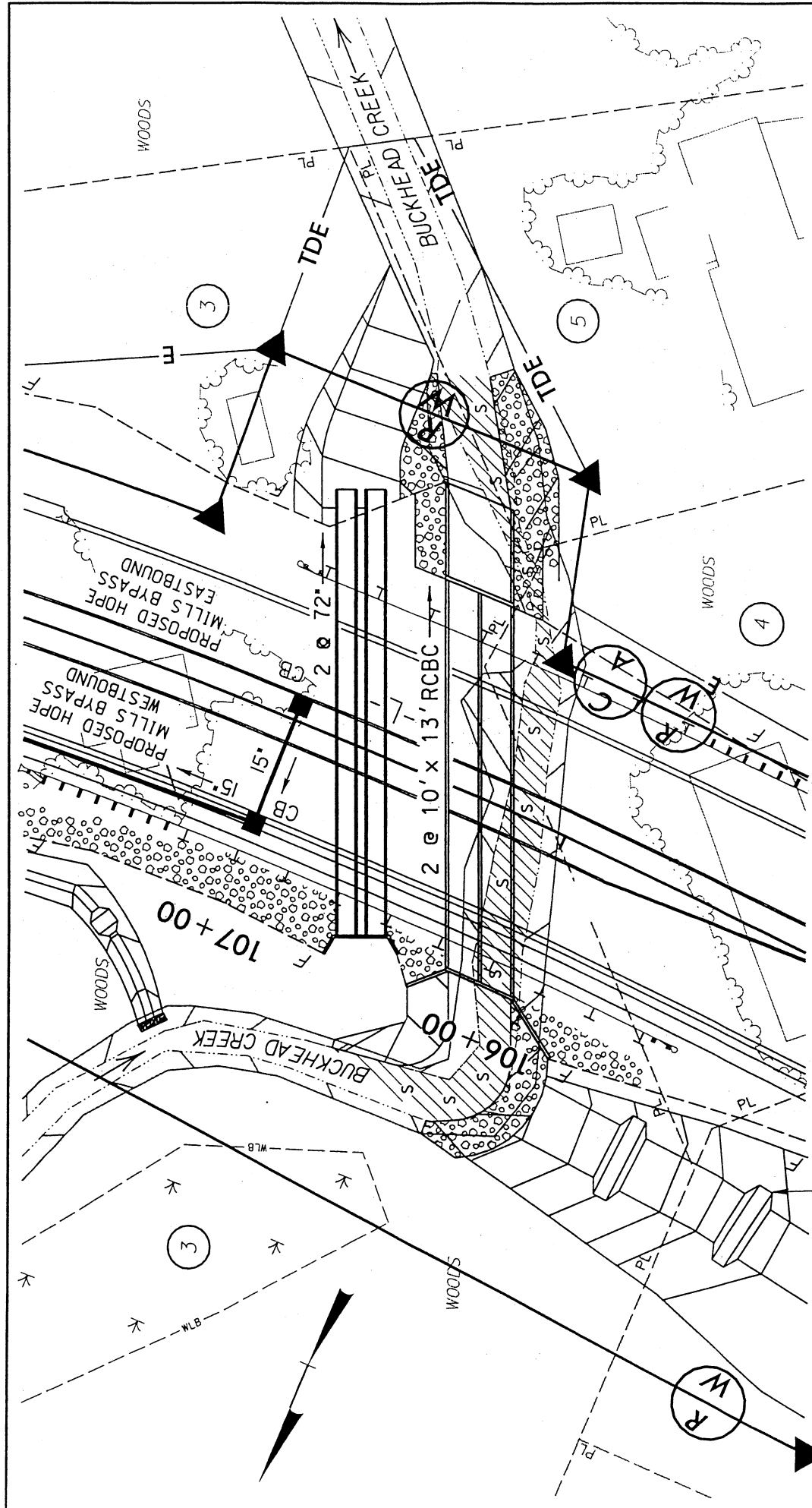
CUMBERLAND COUNTY

PROJECT: 8.1442601 (U-0620)  
HOPE MILLS BYPASS  
FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

SHEET \_\_\_ OF \_\_\_

03/08/02

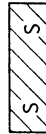
REVISED 4/15/04



# PLAN VIEW SITE 2



DENOTES FILL IN  
SURFACE WATERS



N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

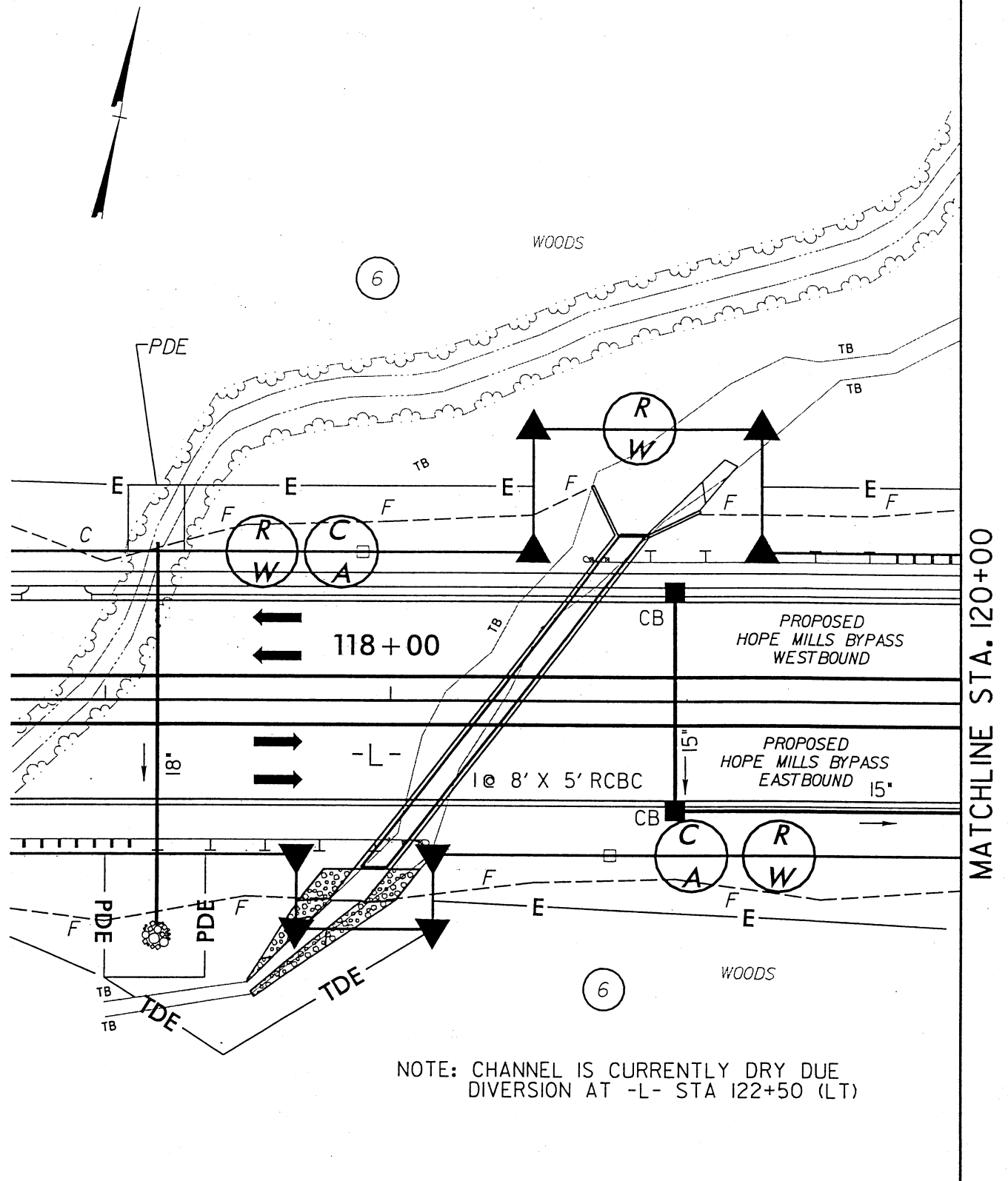
PROJECT: 8.142601 (U-0620)

HOPE MILLS BYPASS

FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

SHEET 1 OF 3  
01/21/03

REVISED 2/3/04







MATCHLINE STA. 123+00

UT TO BEAVER CREEK  
PERENNIAL

WOODS

6

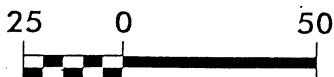
125-00

PROPOSED  
HOPE MILLS BYPASS  
WESTBOUND

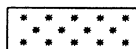
PROPOSED  
HOPE MILLS BYPASS  
EASTBOUND

WOODS  
PERMANENT CHECK  
DAMS (TYP.)

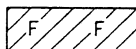
# PLAN VIEW SITE 3



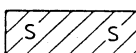
DENOTES MECHANIZED  
CLEARING



DENOTES FILL IN  
WETLANDS



DENOTES FILL IN  
SURFACE WATERS



N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

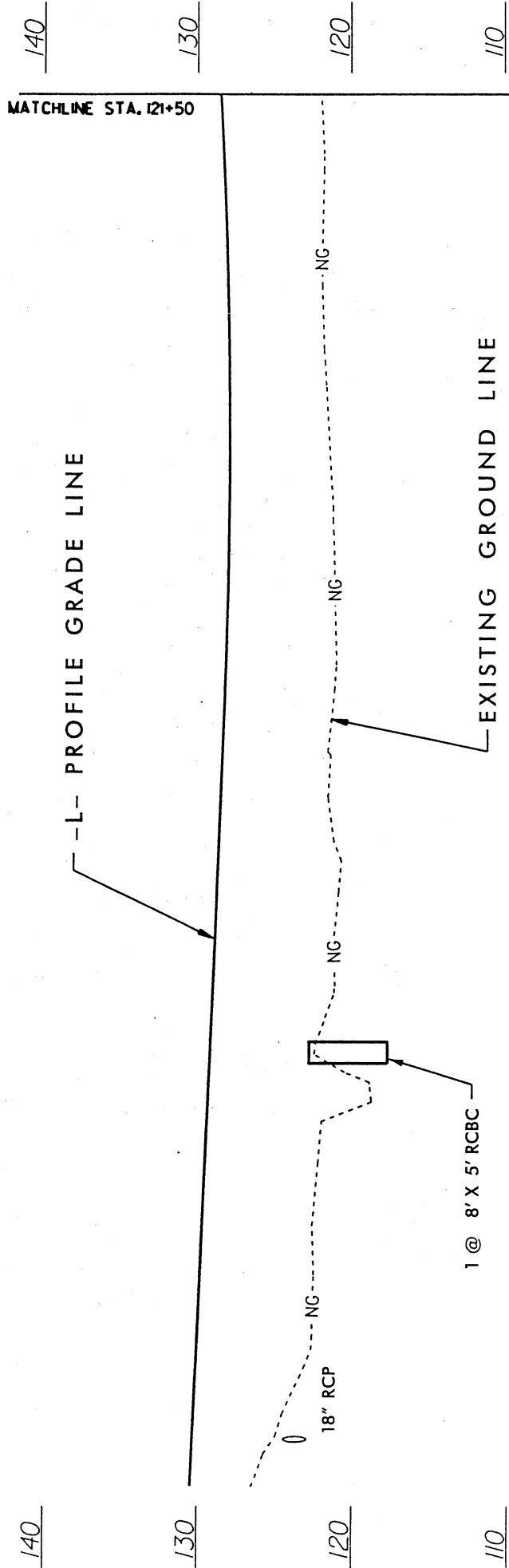
CUMBERLAND COUNTY

PROJECT: 8.1442601 (U-0620)  
HOPE MILLS BYPASS  
FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

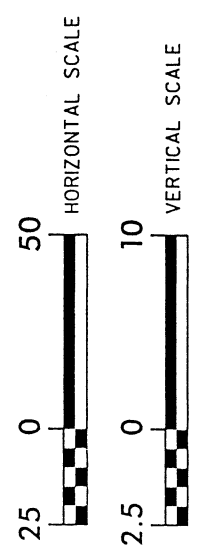
SHEET 10 OF 27

01/21/03

REVISED 2/3/04



# PROFILE SITE 3



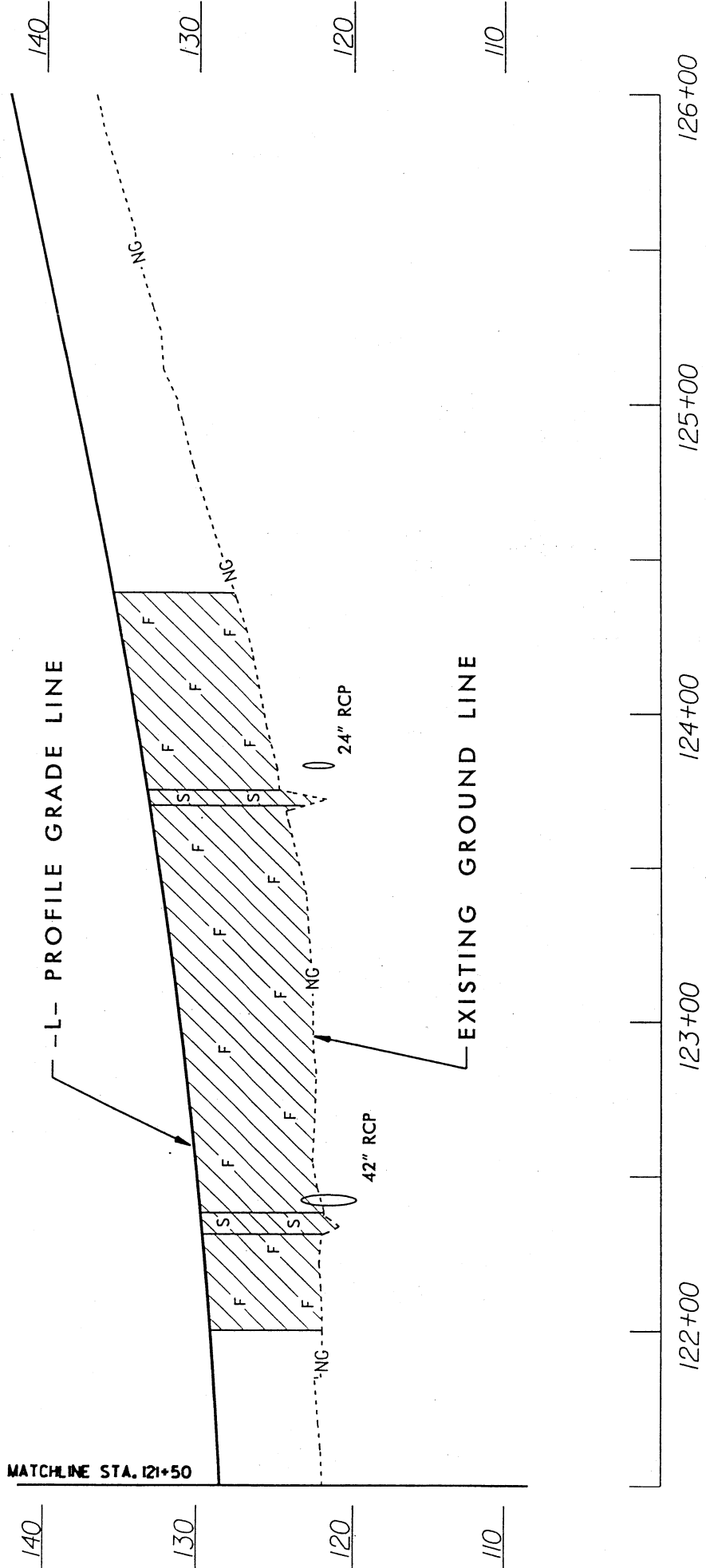
N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

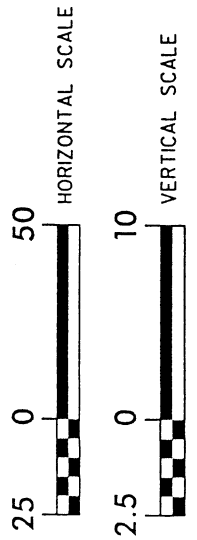
PROJECT: 8.1442601 (U-0620)  
HOPE MILLS BYPASS  
FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

SHEET 1 OF 1

01/21/03

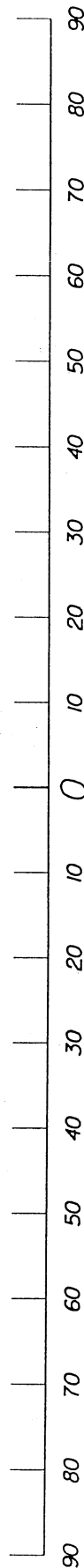


# PROFILE SITE 3

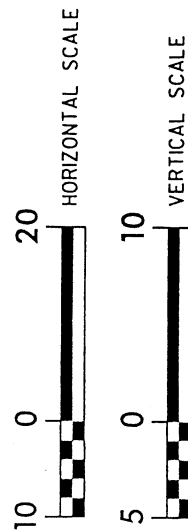


DENOTES FILL IN  
WETLANDS  
 DENOTES FILL IN  
SURFACE WATERS

N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 CUMBERLAND COUNTY  
 PROJECT: 8.1449601 (U-0620)  
 HOPE MILLS BYPASS  
 FROM SR 1141 (BINGHAM DRIVE)  
 TO SR 1363 (ELK ROAD)  
 SHEET 1 OF 1  
 01/21/03



# SITE 3 SECTION A-A



DENOTES FILL IN  
WETLANDS



**N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS**

CUMBERLAND COUNTY

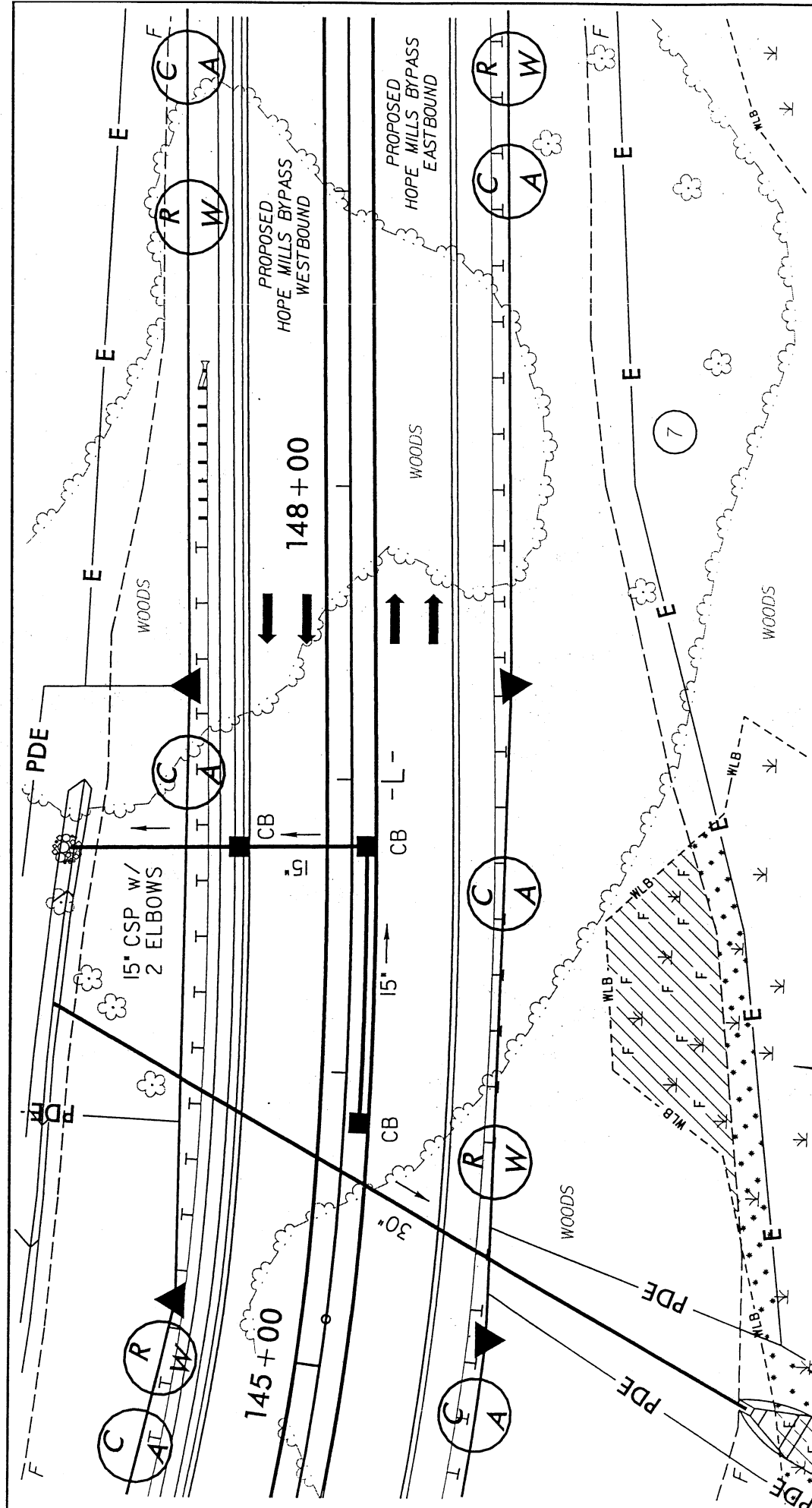
**PROJECT: 8.1442601 (U-0620)**

## HOPE MILLS BYPASS

FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

**SHEET 3 OF 4**

01 / 21 / 03

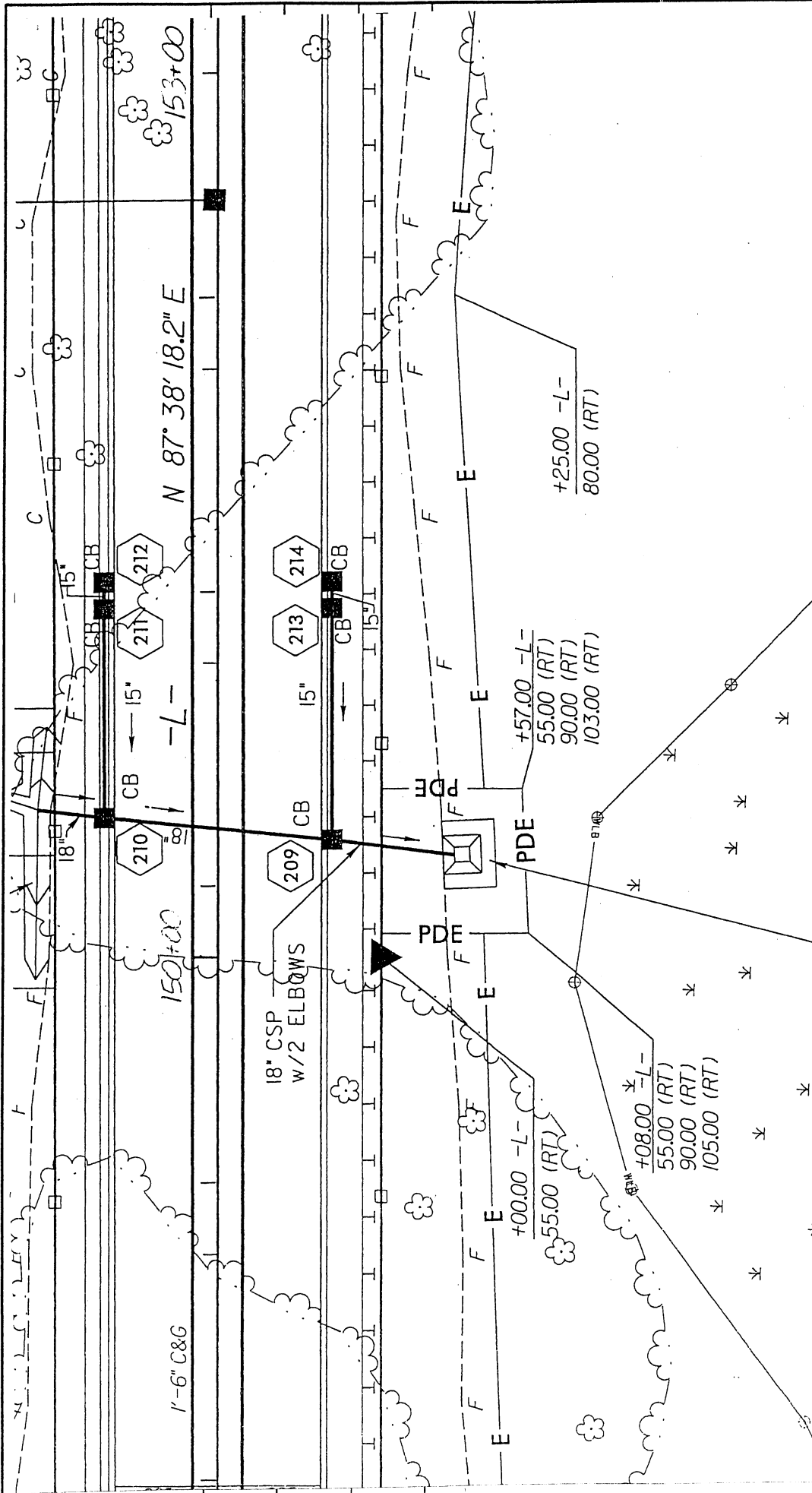


# PLAN VIEW SITE 4

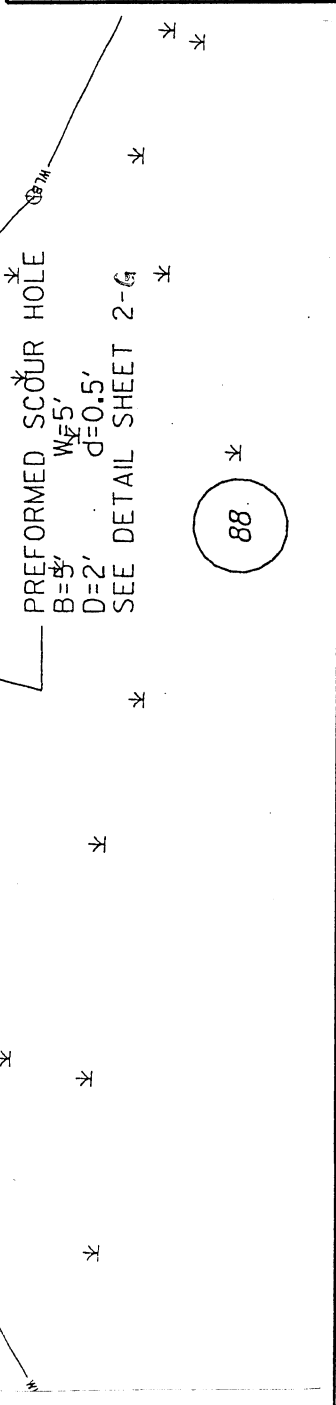
N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 CUMBERLAND COUNTY  
 PROJECT: 81442601 (U-0620)  
 HOPE MILLS BYPASS  
 FROM SR 1141 (BINGHAM DRIVE)  
 TO SR 1363 (ELK ROAD)  
 SHEET 11 OF 22  
 01/21/03

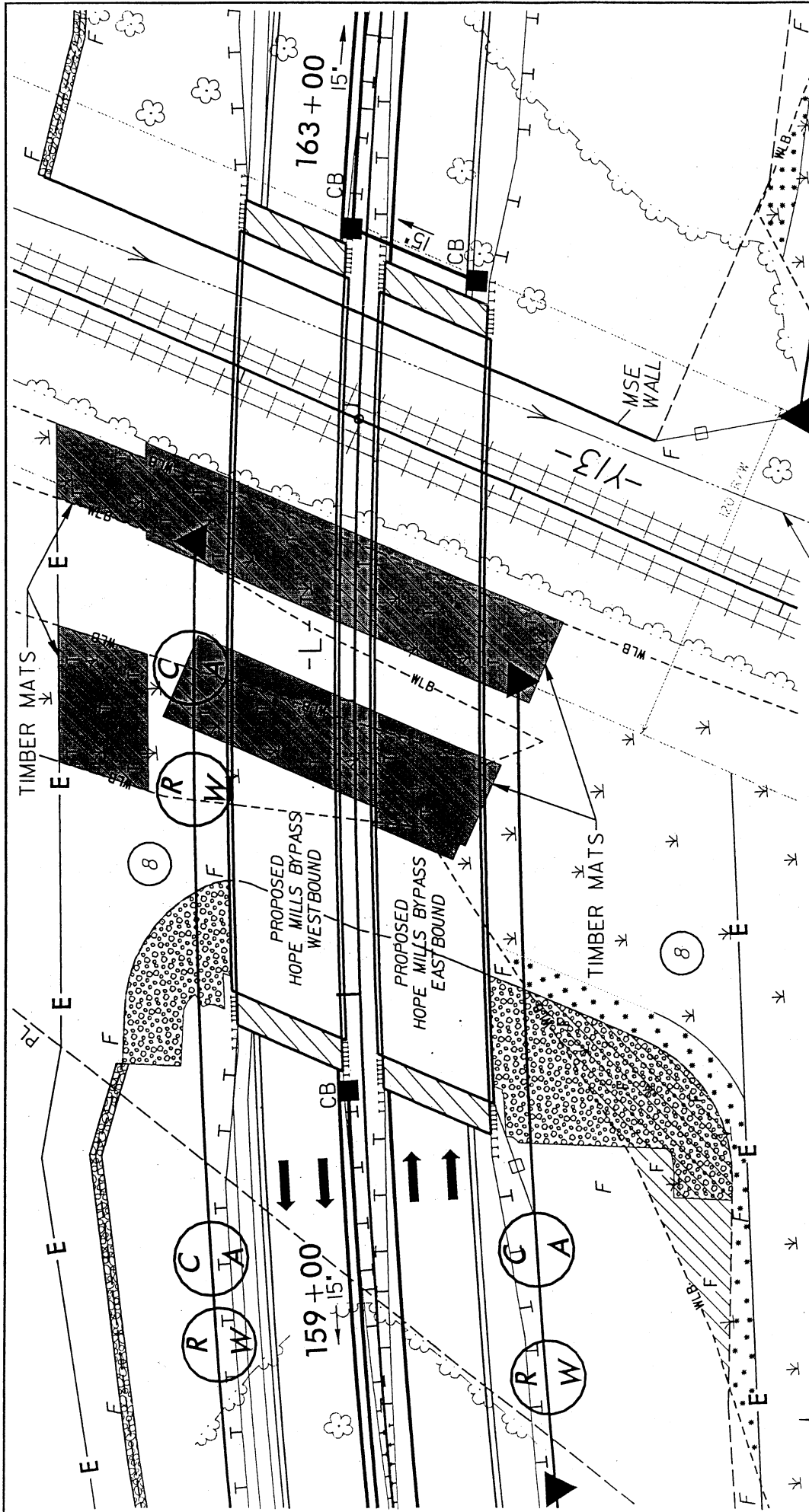
- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLANDS
- DENOTES EXCAVATION IN WETLANDS





N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 CUMBERLAND COUNTY  
 PROJECT: 8.1442601 (U-0620)  
 HOPE MILLS BYPASS  
 FROM SR 1141 (BINGHAM DRIVE)  
 TO SR 1363 (ELK ROAD)  
 SHEET 88 OF 01/21/03





N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

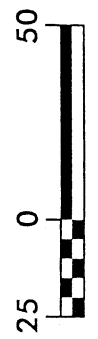
PROJECT: 8142601 (U-0620)  
HOPE MILLS BYPASS  
FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

SHEET 16 OF 17

09/08/03

- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLANDS
- DENOTES TEMPORARY FILL IN WETLANDS

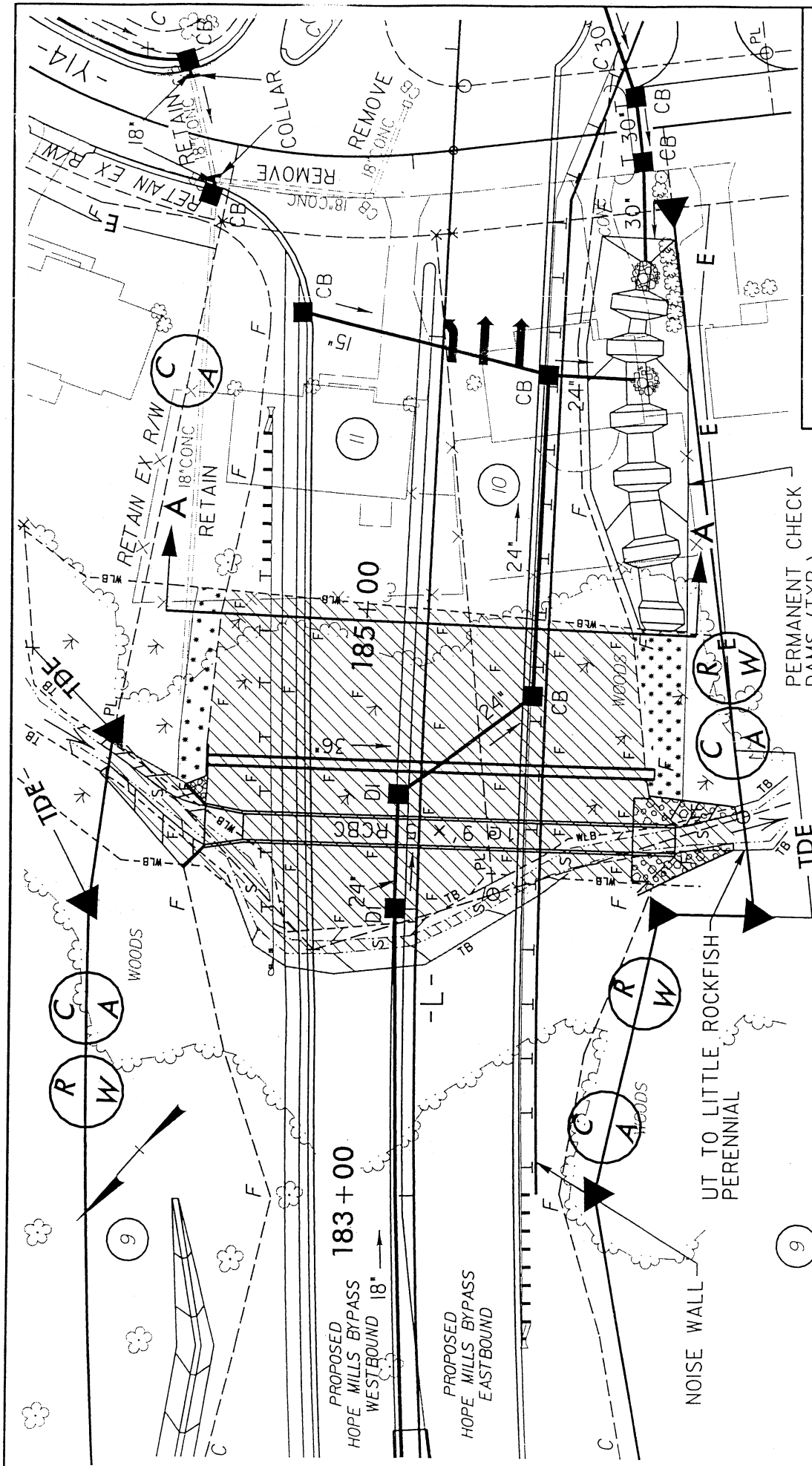
# PLAN VIEW SITE 5









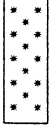

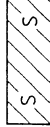


N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

PROJECT: 81442601 (U-0620)  
HOPE MILLS BYPASS  
FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

SHEET \_\_\_\_ OF \_\_\_\_ 01/21/03

-  DENOTES MECHANIZED CLEARING
-  DENOTES FILL IN WETLANDS
-  DENOTES FILL IN SURFACE WATERS

# PLAN VIEW SITE 6



160

160

150

150

140

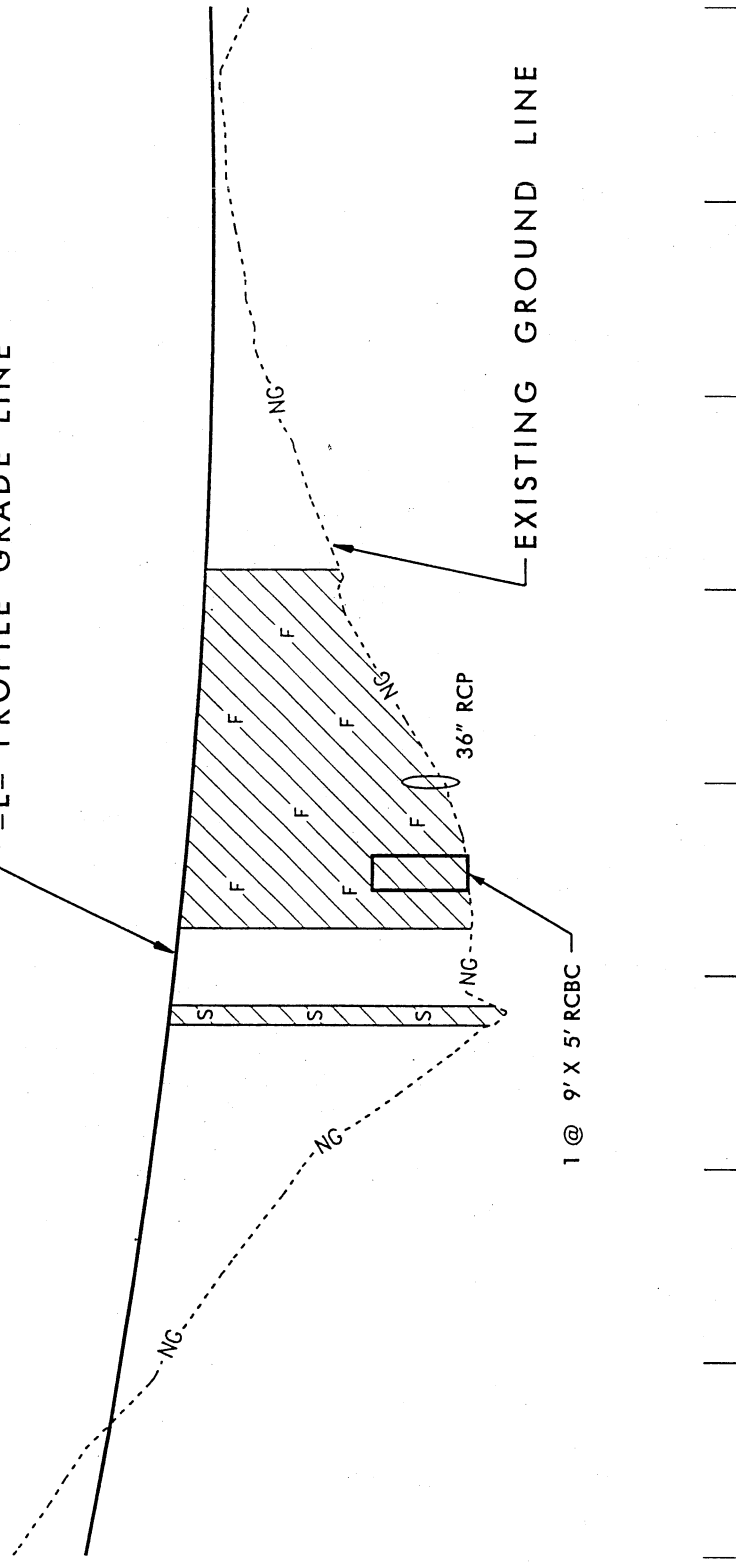
140

130

130

--L-- PROFILE GRADE LINE

EXISTING GROUND LINE

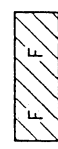


HORIZONTAL SCALE



VERTICAL SCALE

# PROFILE SITE 6



DENOTES FILL IN  
WETLANDS



DENOTES FILL IN  
SURFACE WATERS

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

PROJECT: 8.1442601 (U-0620)

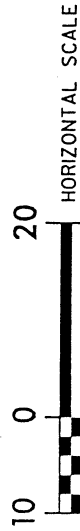
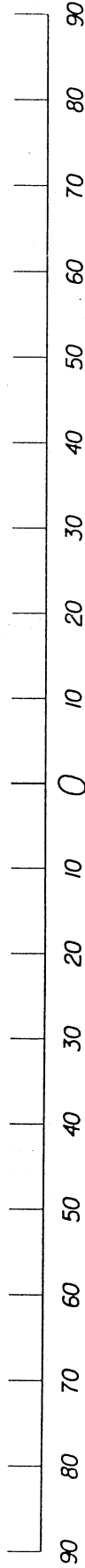
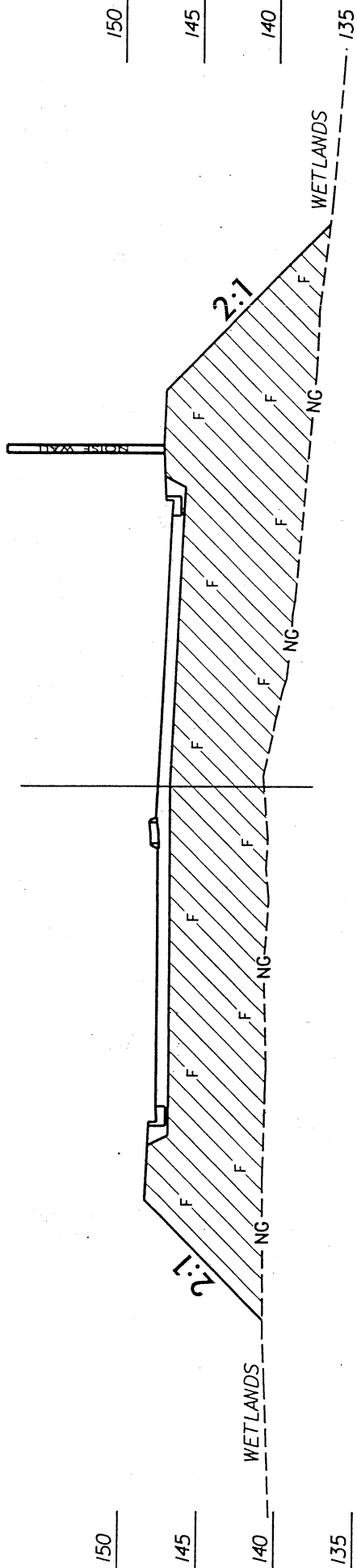
HOPE MILLS BYPASS

FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

SHEET \_\_\_\_ OF \_\_\_\_

01/21/00

185+00 -L-



10 0 20  
HORIZONTAL SCALE

5 0 10  
VERTICAL SCALE



# SITE 6 SECTION A-A

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

PROJECT: 8.1442601 (U-0620)

HOPE MILLS BYPASS

FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

SHEET \_\_\_ OF \_\_\_

01/21/03

REVISED 2/3/04

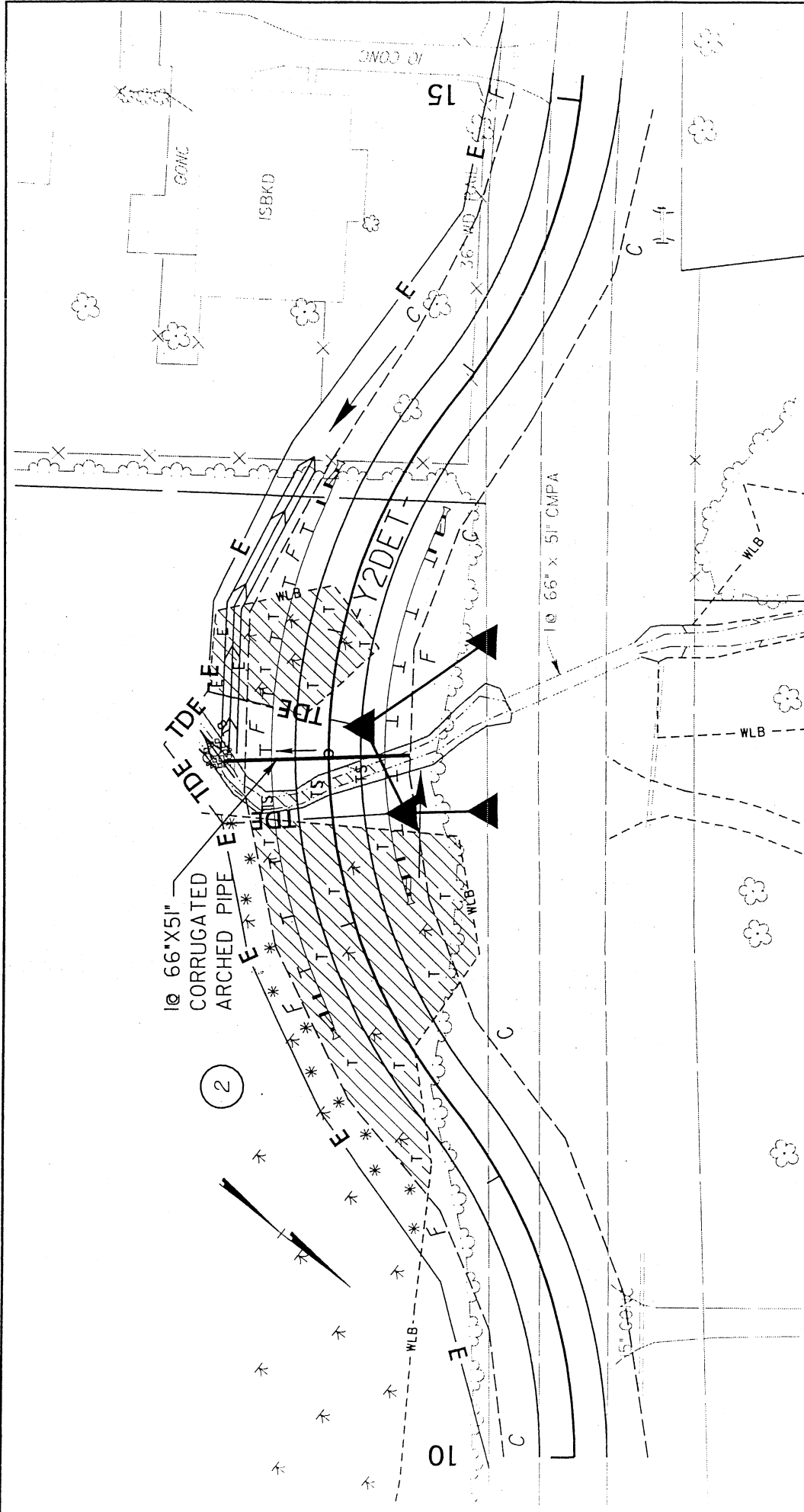


REVISÉ 4/15/04

DENOTES FILL IN  
 SURFACE WATERS

# PLAN VIEW SITE 7





N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

PROJECT: 8.1442601 (U-0620)

HOPE MILLS BYPASS

FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

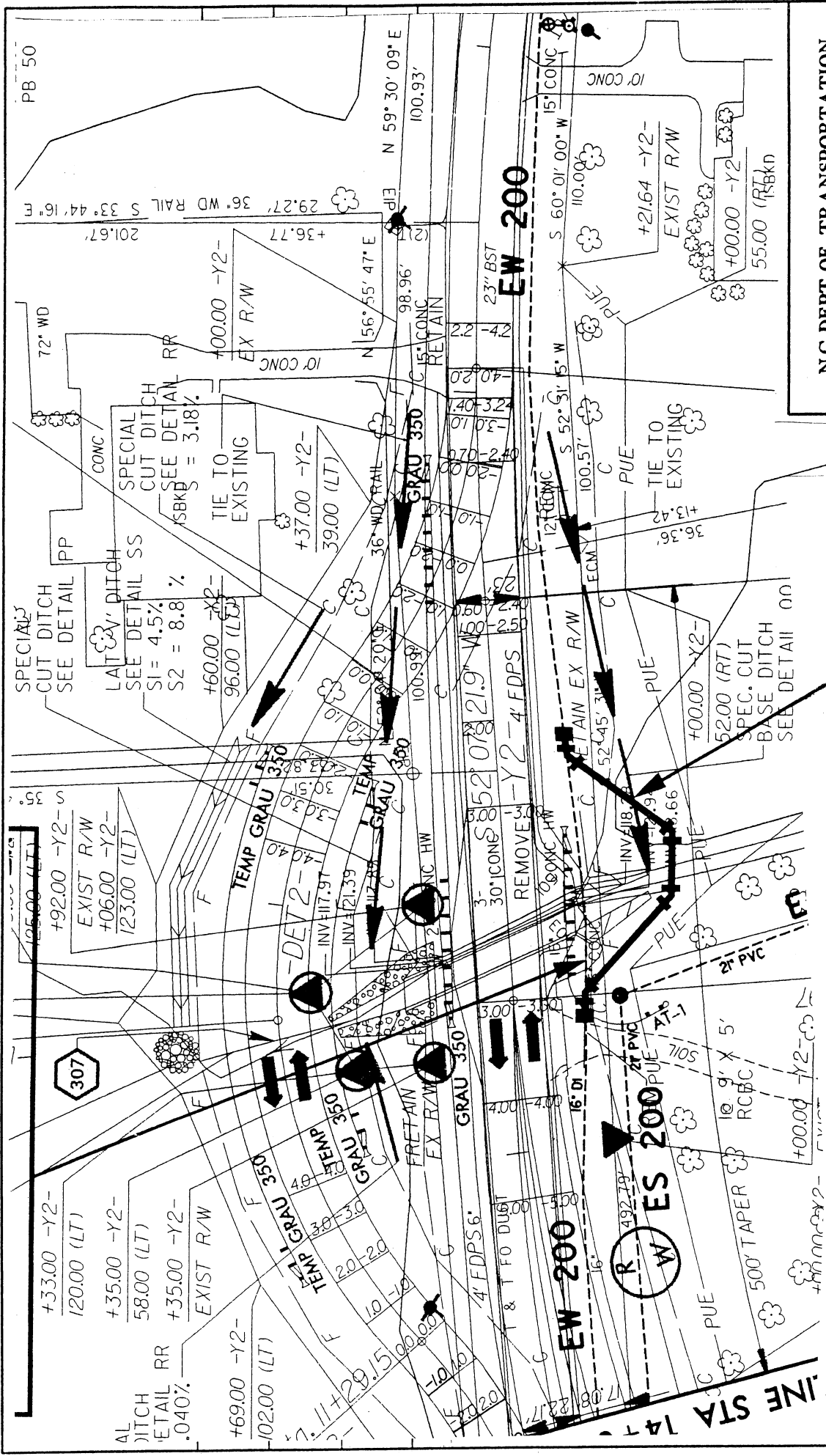
SHEET 11 OF 11 01/21/03

- DENOTES MECHANIZED CLEARING
- DENOTES TEMP. FILL IN WETLANDS
- DENOTES EXCAVATION IN WETLANDS
- DENOTES TEMP. FILL IN SURFACE WATERS

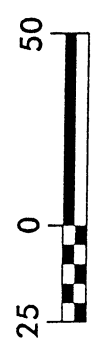
## PLAN VIEW SITE 7A



REVISED 4/15/04



POSSIBLE WATER LINE  
REALIGNMENT  
SITE 7



N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
CUMBERLAND COUNTY  
PROJECT: 8.1442601 (U-0620)  
HOPE MILLS BYPASS  
FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)  
SHEET 14 OF 20 01/21/03

# WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS				
			Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
1	-L- 34+90 / 39+57	1 @ 72" RCP	0.699			0.0739	0.0375			201.6	
2	-L- 105+83 / 106+95	2 @ 10' x 13' RCBC w/ 2 @ 72" RCP					0.0825			279.8	
3	-L- 121+56 / 125+73	1 @ 42" RCP	0.6879		0.0133	0.1204	0.0197			164.8	
4	-L- 145+20 / 146+83	1 @ 24" RCP					0.0078			169.2	
5	-L- 159+45 / 160+15		0.0713		0.0071	0.0634					
	-L- 160+45 / 161+91		0.0685	0.2029		0.0401					
	-L- 162+57/ 163+25					0.049					
6	-L- 183+85 / 185+08	1 @ 9' x 5' RCBC w/ 1 @ 36" RCP	0.3508			0.0368	0.0302			259.5	
7	-Y2- 15+47 / 16+00	1 @ 9' x 5' RCBC	0.0017		0.0046	0.0205	0.0084			77.77	
7A	-Y2DET- 12+42 / 12+61	1 @ 66" x 51" CMPA		0.1559	0.0087	0.0374			0.0051	62.5	
TOTALS:			1.8792	0.3588	0.0337	0.4415	0.1861	0	0.0051	1215.17	0

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

PROJECT 8.1442601 (U-0620)  
HOPE MILLS BYPASS  
FROM SR 1141 (BINGHAM DRIVE) TO SR 1363 (ELK ROAD)

Form Revised 1/21/03

SHEET - OF

9/8/03

Revised 4/15/04



## Property Owner List

Site NO.	Parcel NO.	Name DB and Pg	Address
1	(1)	Dixie Yarns, Inc. DB 499 Pg 315	P.O. BOX 751 Chattanooga, TN 37401
	(2)	March F. Riddle DB 4875 Pg 626	P.O. BOX 53646 Fayetteville, NC 28305
2	(3)	Vance Andrew Blanton DB 3048 Pg B36	P.O. BOX 64682 Fayetteville, NC 28306
	(4)	Ernest Rickey Barefoot DB 4693 Pg 264	7090 Lamplighter Dr. Fayetteville, NC 28306
	(5)	Helen B. Norris DB 2975 Pg 437	P.O. BOX 585 Hope Mills, NC 28348
3	(6)	N.H. McGeachy, Jr. DB 4789 Pg 243	P.O. BOX 747 Fayetteville, NC 28302
4	(7)	Mary Alma Gillis DB 4093 Pg 287	8621 Galatia Church Rd. Fayetteville, NC 28306
5	(8)	John McNatt Gillis, Jr. DB 4582 Pg 206	8621 GALATIA CHURCH RD <del>Not Provided</del> FAYETTEVILLE, NC 28306

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

PROJECT: 8.1442601 (U-0620)  
HOPE MILLS BYPASS  
FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

SHEET      OF     

01 / 21 / 03

**Property Owner List**

Site NO.	Parcel NO.	Name DB and Pg	Address
6	(9)	Land Associates, Inc. DB 3186 Pg 495 PB 50 PG 32	874 Long Iron Drvie Fayetteville, NC 28301
	(10)	Thomas F. Ganus, Jr. DB 4046 Pg 558 PB 81 PG 78	5041 Pinewood Drive Hope Mills, NC 28348
	(11)	N.C. Dept. of Transportation DB 4986 Pg 813 PB 81 PG 78	558 Gillespie Street Fayetteville, NC 28301
7	(2)	March F. Riddle  DB 4875 Pg 626	P.O. BOX 53646 Fayetteville, NC 28305
	(12)	Audrey C. Scroggins  PG 2194 PG 547	RR 8 BOX 200 Fayetteville, NC 28304
7A	(2)	March F. Riddle  DB 4875 Pg 626	P.O. BOX 53646 Fayetteville, NC 28305

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

PROJECT: 8.1442601 (U-0620)  
HOPE MILLS BYPASS  
FROM SR 1141 (BINGHAM DRIVE)  
TO SR 1363 (ELK ROAD)

SHEET 17 OF 27

01 / 21 / 03

**APPENDIX B**  
**4C Meeting Minutes**

**Subject:** Minutes of the Interagency Permit Drawing Review Meeting held on August 22, 2002 for U-620, Cumberland County  
*February 3, 2003 TCE Responses*

<b>Team Members:</b>	Richard Spencer	USACE(PRESENT)
	John Hennessy	NCDWQ (PRESENT)
	David Cox	NCDWQ (PRESENT)
	Howard Hall	USFWS (ABSENT)
	Chris Militscher	EPA (PRESENT)
	Tim Bassette	DOT-PD&EA (PRESENT)

<b>Participants:</b>	David Chang	DOT-Hydraulics	919-250-4100
	Susan Locklear	DOT-Hydraulics	919-250-4100
	Marshall Clawson	DOT-Hydraulics	919-250-4100
	Virginia Mabry	DOT-Design Services	919-250-4128
	Cathy Houser	DOT-Design Services	919-250-4128

The meeting was conducted to review permit drawings. During the course of the meeting it was requested by the agencies that a copy of the bridge/culvert reports be included with future permit applications.

**General Comment:** No rip rap is to be placed in beds/channels.  
*Comment incorporated.*

**Sheet 5 (of plans):** Drawings should be provided for bridge although there should be no impacts associated. Embankment riprap should also be shown at this site.  
*Comments incorporated, Site 1A.*

**Sheet 6 (of plans)/current Site 1:** Pipe should be buried 1'.  
*As discussed during review meeting, this pipe was designed to be buried 1.0'. Also, Site revised from Site 1 to Site 1B.*

**Sheet 6 (of plans):** Hennessy asked if we considered discharging outlet right of station 37+00 into the wetland. Marshall responded that with a 36" pipe, non-erosive velocities would not be obtained. Hennessy then confirmed that he likes the proposed design.  
*No action required.*

**Sheet 11 (of plans)/current Site 2:** Installation of sill was discussed, along with a low flow bench. Hennessy stated that if a cross vane was to be installed downstream, he would be okay with the design. A cross vane may be required upstream also. Per Hennessy, vanes may possibly be removed if stream is found to be too incised.  
*As discussed and agreed during review, the existing channel is severely incised. Therefore, no action required.*

**Sheet 12 (of plans)/current Site 3:** Current design is favorable. Site is to re-establish previous flow pattern. Alterations have occurred due to sewer line installation. A site 3A should be created which shows old streambed and impacts at the box culvert location. Better clarify flow patterns, both existing and natural. Hennessy to discuss with his people about utility company's responsibility to correct.

***Comment incorporated. The limits of Site 3 have been expanded to show the approximate stream location and proposed RCBC crossing.***

**Sheet 14 (of plans)/current Site 4:** Change stormwater to discharge to the right, outside of wetlands.

***As discussed and agreed during review, no action is required on this item due to the minimal roadway drainage involved.***

Investigate some type of energy dissipater at end of 30" cross pipe. Even if this has to encroach into wetland, agencies prefer over allowing the velocities to cut a channel through the wetland. (This also needs to be investigate between station 150-155 on plan sheet 14)

***Comments incorporated. An energy dissipator basin has been placed at the outlet of the 30" RCP and a preformed scour hole has been placed at the outlet of the 18" RCP right of -L- Sta. 150+30.***

**Sheet 15 (of plans):** A drawing is needed for station 157+25 where 30" pipe discharges just outside of wetland. Drawing needs to include drainage area, Q2, Q10, Q2 velocity and Q10 velocity.

***Per discussions with Marshall Clawson, a formal permit drawing will not be required. Marshall advised that an 8 1/2" x 11" copy of the revised designs would be adequate. A preformed scour hole has been added right of -L- Sta. 157+25.***

**Sheet 15 (of plans)/current Site 5:** OK. However, drawing is needed for discharge pipe into wetland at station 165+00 on plan sheet 15.

***Per discussions with Marshall Clawson, a formal permit drawing will not be required. Marshall advised that an 8 1/2" x 11" copy of the revised designs would be adequate. A preformed scour hole has been added right of -L- Sta. 164+50.***

**Sheet 17 (of plans)/current Site 6:** Bankful depth, width, etc. requested by Hennessy. If not overly incised, cross vanes may be requested.

***As discussed and agreed, please find attached cross section plots at the upstream face, centerline and downstream face.***

**Current Site 7:** OK

***No action required.***

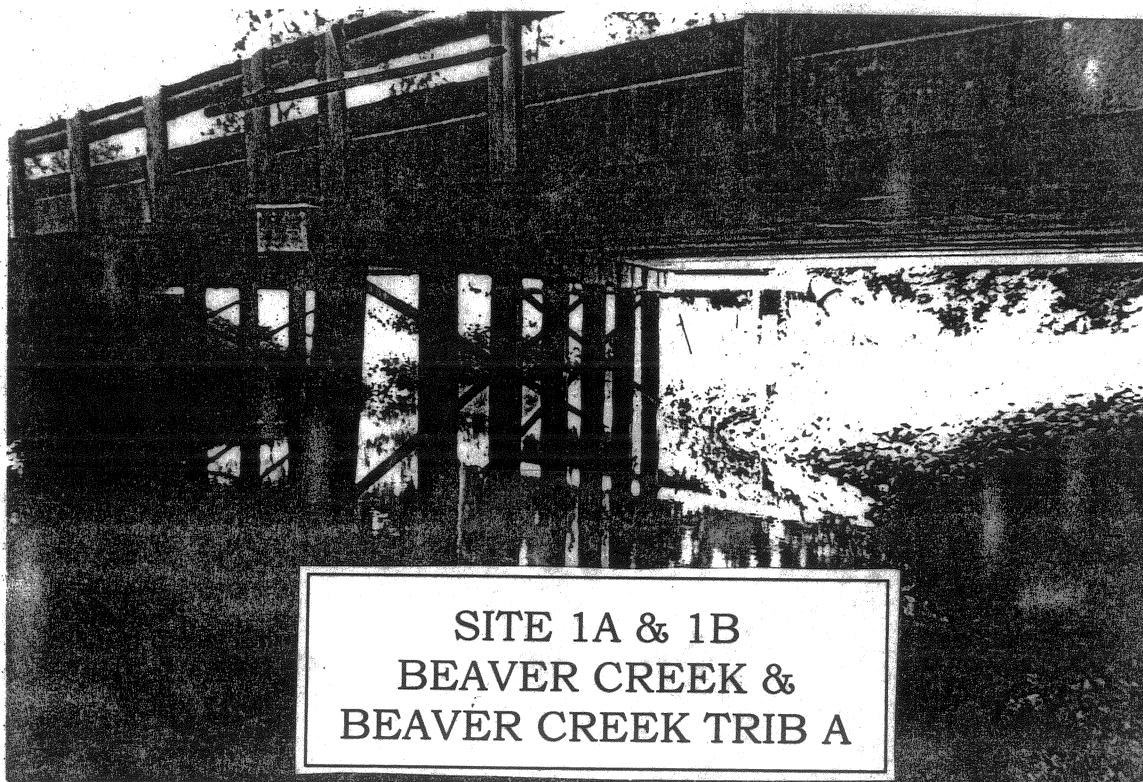
**APPENDIX C**  
**Bridge / Culvert Reports**

# BRIDGE SURVEY & HYDRAULIC DESIGN REPORT

N. C. DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
HYDRAULICS UNIT  
RALEIGH, N. C.

MC

I.D. No. U-0620 Project No. 8.1442601 Proj. Station 32+18.00 -L-  
County CUMBERLAND Bridge Over BEAVER CREEK Bridge Inv. No. 105  
On Highway HOPE MILLS BYPASS Between SR 1107 and SR 1133  
FISHER RD. GEORGE OWEN RD.  
Recommended Structure 1 SPAN @ 38'-0" (36" GIRDER), 1 SPAN @ 64'-0"  
(45" GIRDER), 1 SPAN @ 38'-0" (36" GIRDER), TOTAL BRIDGE LENGTH= 140'-0"  
Recommended Width of Roadway 125'-6" Skew 65°  
Location is (Up, At, Down Stream from Existing Crossing) REPLACES EXISTING BRIDGE No. 105  
Nearest Shipping Point HOPE MILLS On SOUTHERN R.R., 3.0± Miles From Bridge  
Bench Mark Is CUT IN CONC. ON BRIDGE END BENT 50.52' LT OF -L- STA. 32+54.64  
Elev. 125.63 Datum: NGVD 29  
Temporary Crossing NOT REQUIRED, TRAFFIC TO BE DETOURED



SITE 1A & 1B  
BEAVER CREEK &  
BEAVER CREEK TRIB A

Designed by: **TRANSITE CONSULTING ENGINEERS, INC.**

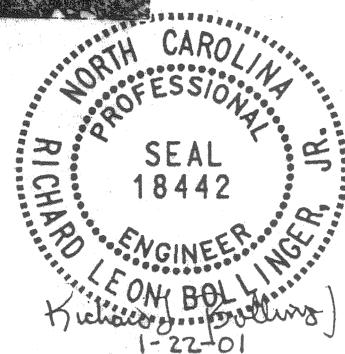
Assisted by: JAB, PCP

Project Engineer: RLB

Reviewed & Approved by:

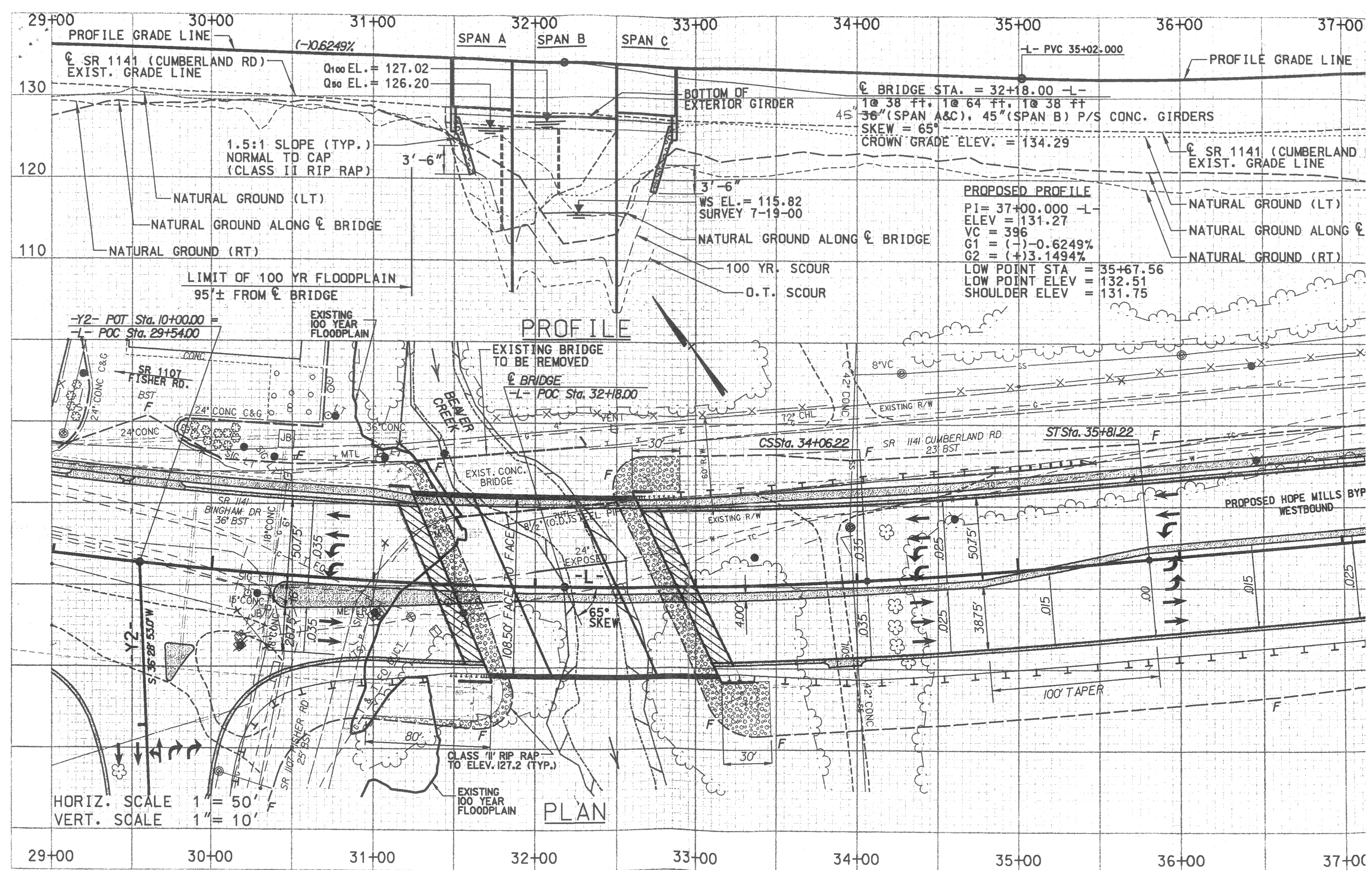
*Susan Payne*

Date

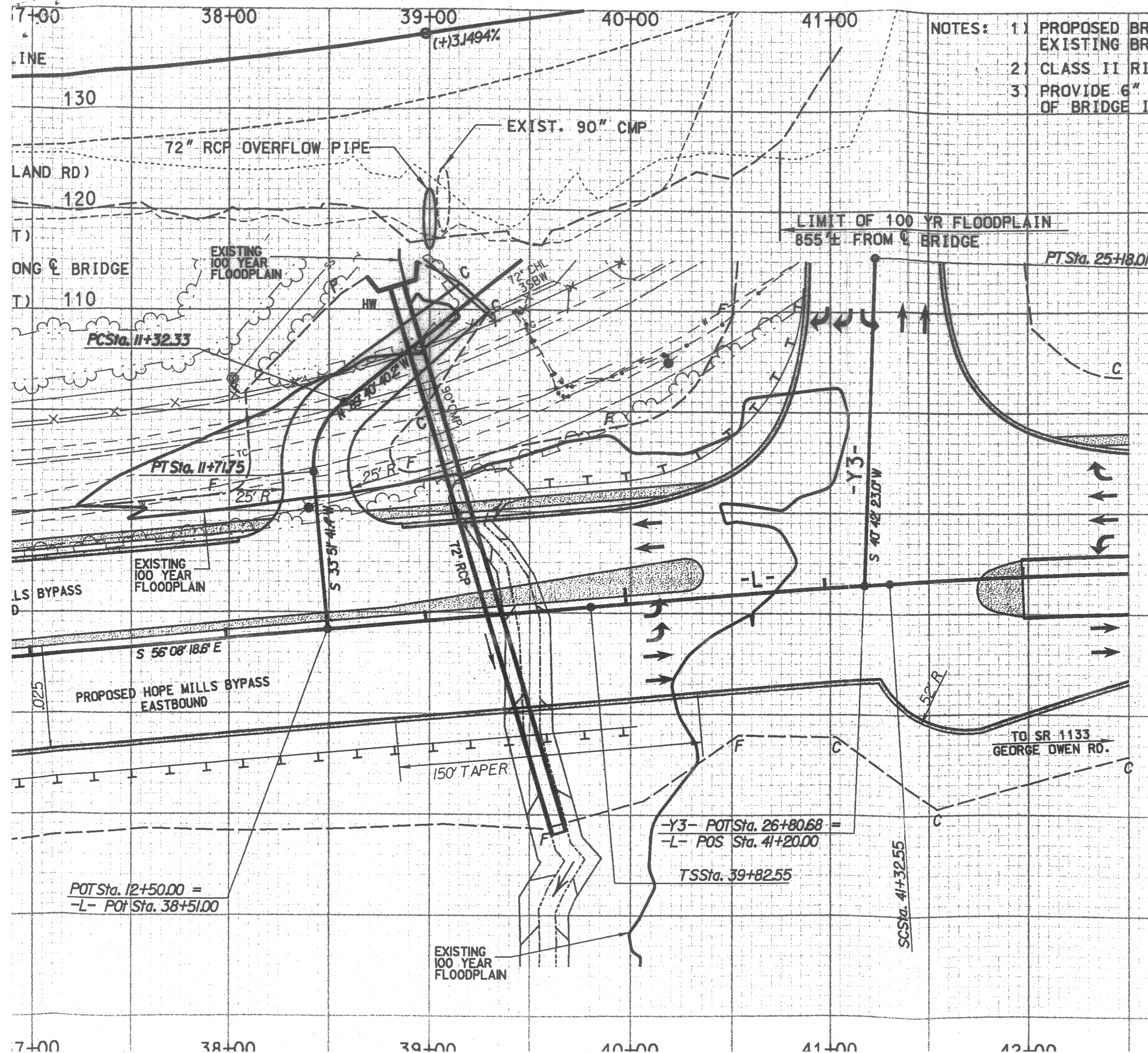


Stream BEAVER CREEK Bridge Inv. No. 105 I.D. No. U-0620 Project No. 8.1442601



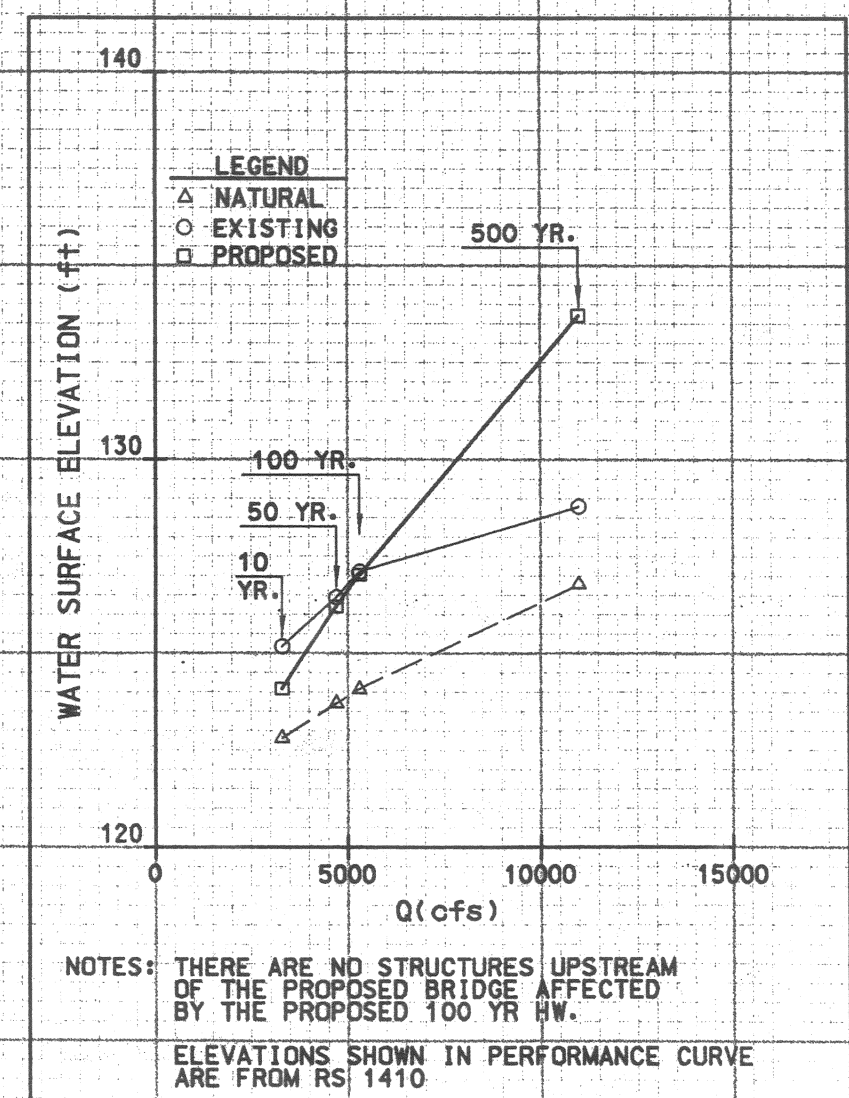






- NOTES:
- 1) PROPOSED BRIDGE OPENING = 1030 sf BELOW THE 100 YR. HW  
EXISTING BRIDGE OPENING = 739 sf
  - 2) CLASS II RIPRAP TO BE PLACED ON END BENT SLOPES AND BERMS
  - 3) PROVIDE 6" DECK DRAINS @ 8'-0" CENTERS ON THE LEFT SIDE OF BRIDGE IN SPAN A AND C (LOW SIDE OF SUPERELEVATION)

END BENTS: HP 12x53 steel piles  
 INTERIOR BENTS: HP 14x73 steel piles

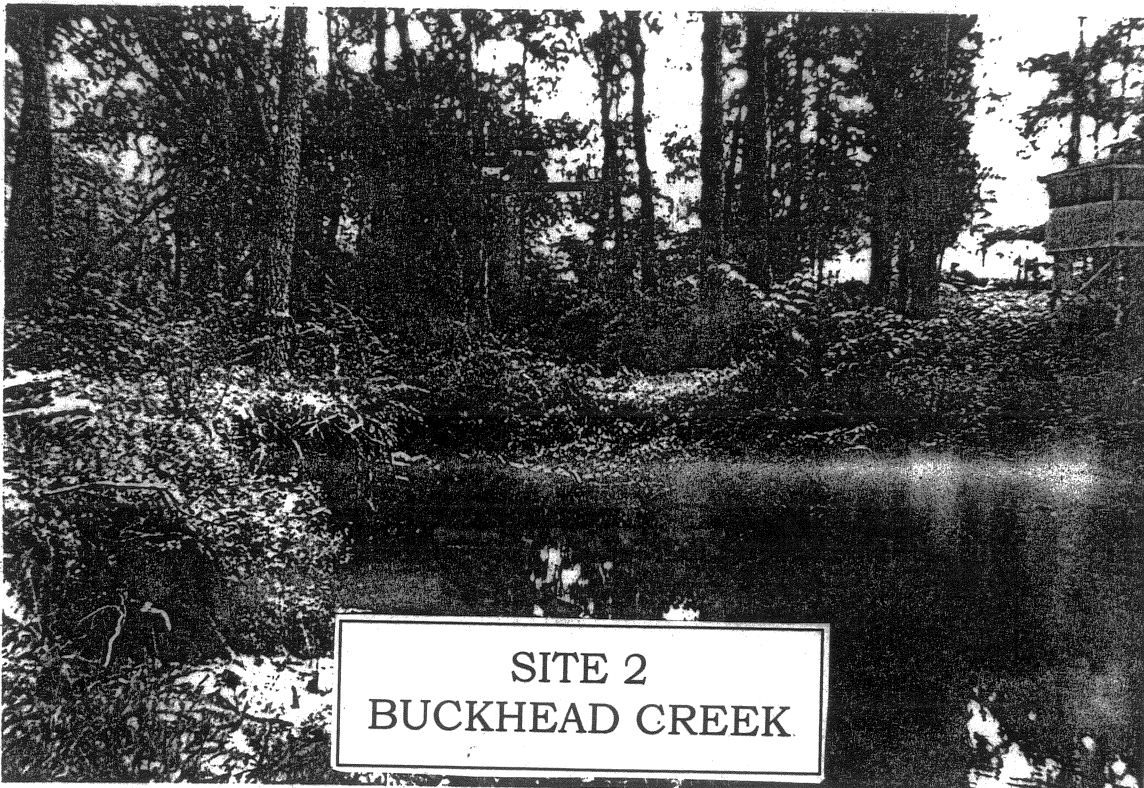


PERFORMANCE CURVE

# CULVERT SURVEY & HYDRAULIC DESIGN REPORT

N. C. DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
HYDRAULICS UNIT  
RALEIGH, N. C.

I.D. No. U-0620 Project No. 8.1442601 Proj. Station 106+32.00 -L-  
County CUMBERLAND Stream BUCKHEAD CREEK Stru. No.  
On Highway HOPE MILLS Between SR 3065 and SR 1003  
BYPASS COLUMBINE RD. CAMDEN RD.  
Recommended Structure 2 @ 10' x 13' RCBC W/ 2 @ 72" RCP OVERFLOW PIPES  
Recommended Location Is Up, (At), Down Stream from Existing Crossing. NEW LOCATION  
Recommended Width of Roadway 101.5' (SP to SP) Skew 66°  
Bench Mark Is BM#102 R.R. SPIKE IN BASE OF 24" PINE 96.36' LT. OF  
-L- STA. 115+74.72 Elev. 124.66 ft Datum: NGVD 29  
Temporary Crossing NOT REQUIRED



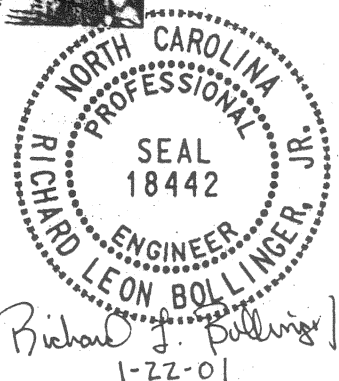
Designed by: TRAN SITE CONSULTING ENGINEERS, INC.

Assisted by: JAB, PCP, DEL

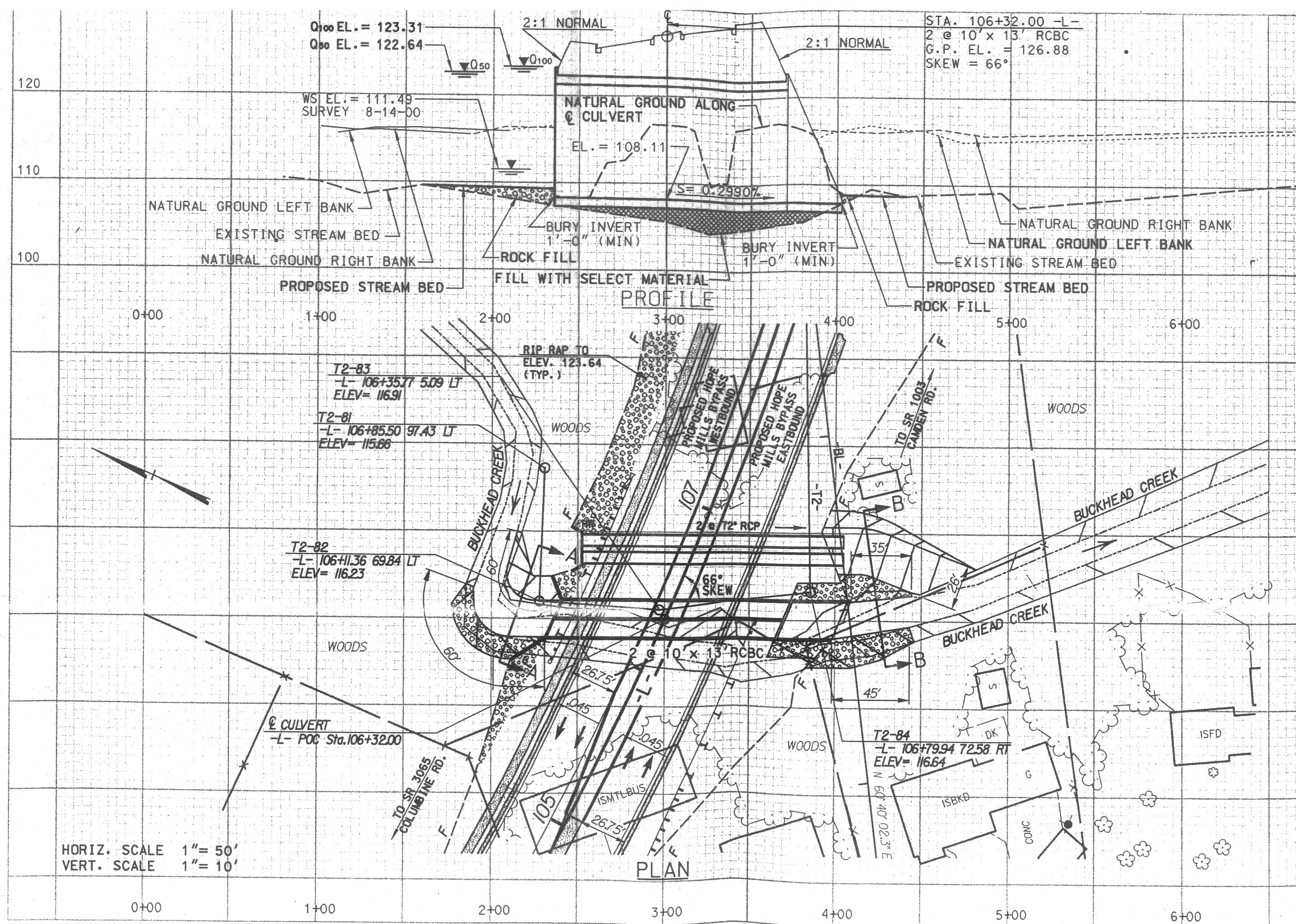
Project Engineer: RLB

Reviewed & Approved by: Susan Payne

Date



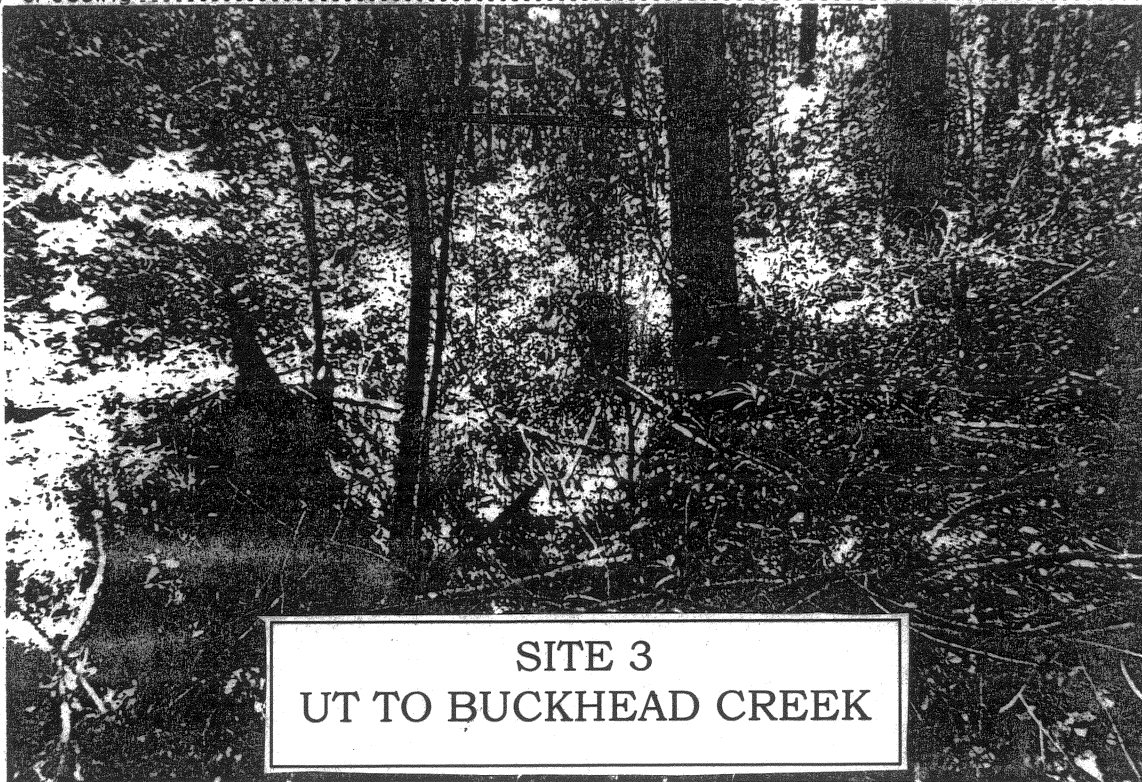




# CULVERT SURVEY & HYDRAULIC DESIGN REPORT

N. C. DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
HYDRAULICS UNIT  
RALEIGH, N. C.

I.D. No. U-0620 Project No. 8.1442601 Proj. Station 118+40.00 -L-  
County CUMBERLAND Stream BUCKHEAD CREEK TRIBUTARY Stru. No.  
On Highway HOPE MILLS Between SR 3065 and SR 1003  
BYPASS COLUMBINE RD. CAMDEN RD.  
Recommended Structure 1 @ 8' x 5' RCBC  
OVERFLOW1: 1 @ 42" RCP OVERFLOW2: 1 @ 24" RCP  
Recommended Location Is Up, (At) Down Stream from Existing Crossing. NEW LOCATION  
Recommended Width of Roadway 73.5' (FC to FC) Skew 128°  
Bench Mark Is BM#102 R.R. SPIKE IN BASE OF 24" PINE 96.36' LT. OF  
-L- STA. 115+74.72 Elev. 124.66 ft Datum: NGVD 29  
Temporary Crossing NOT REQUIRED



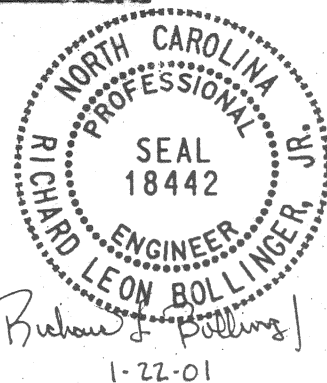
Designed by: TRAN SITE CONSULTING ENGINEERS, INC.

Assisted by: JAB, PCP, ERP

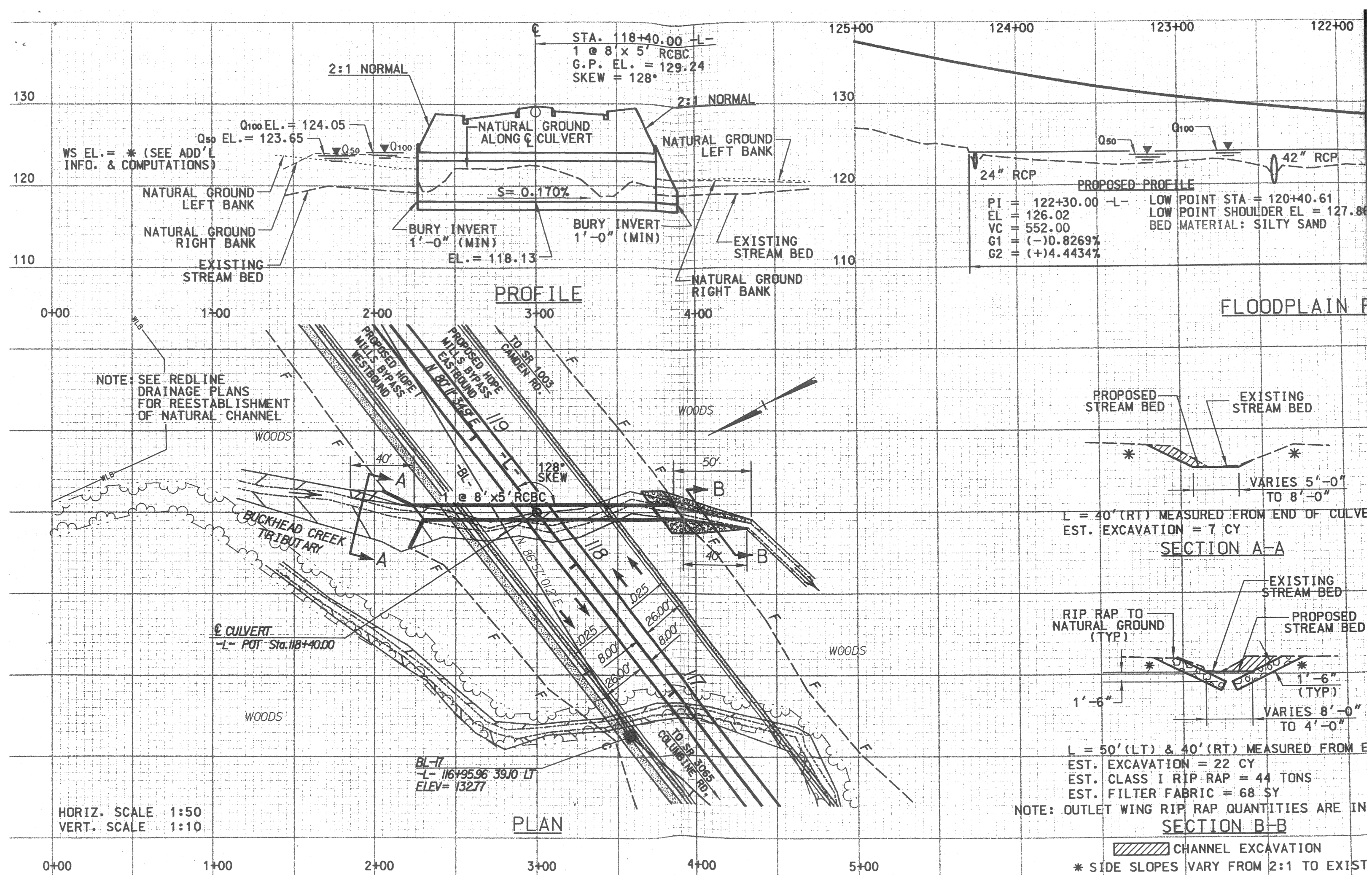
Project Engineer: RLB

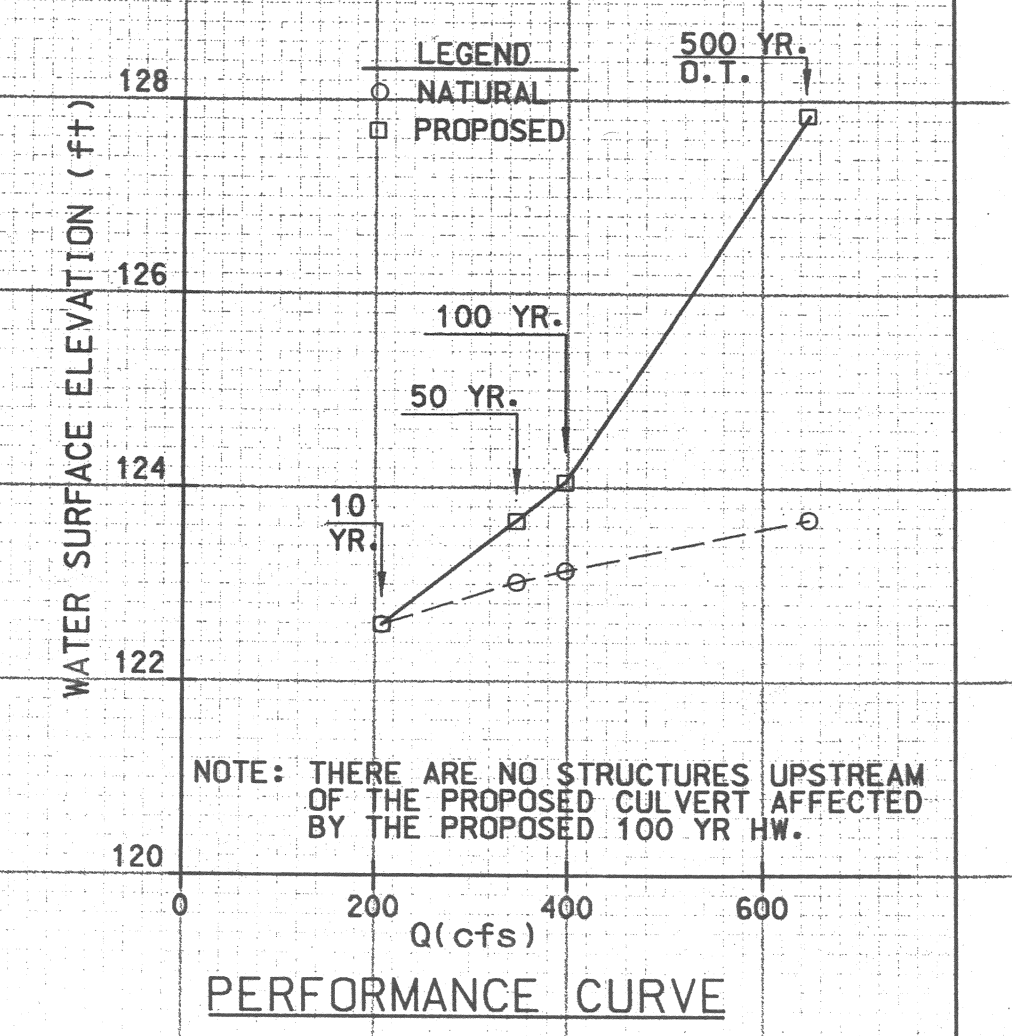
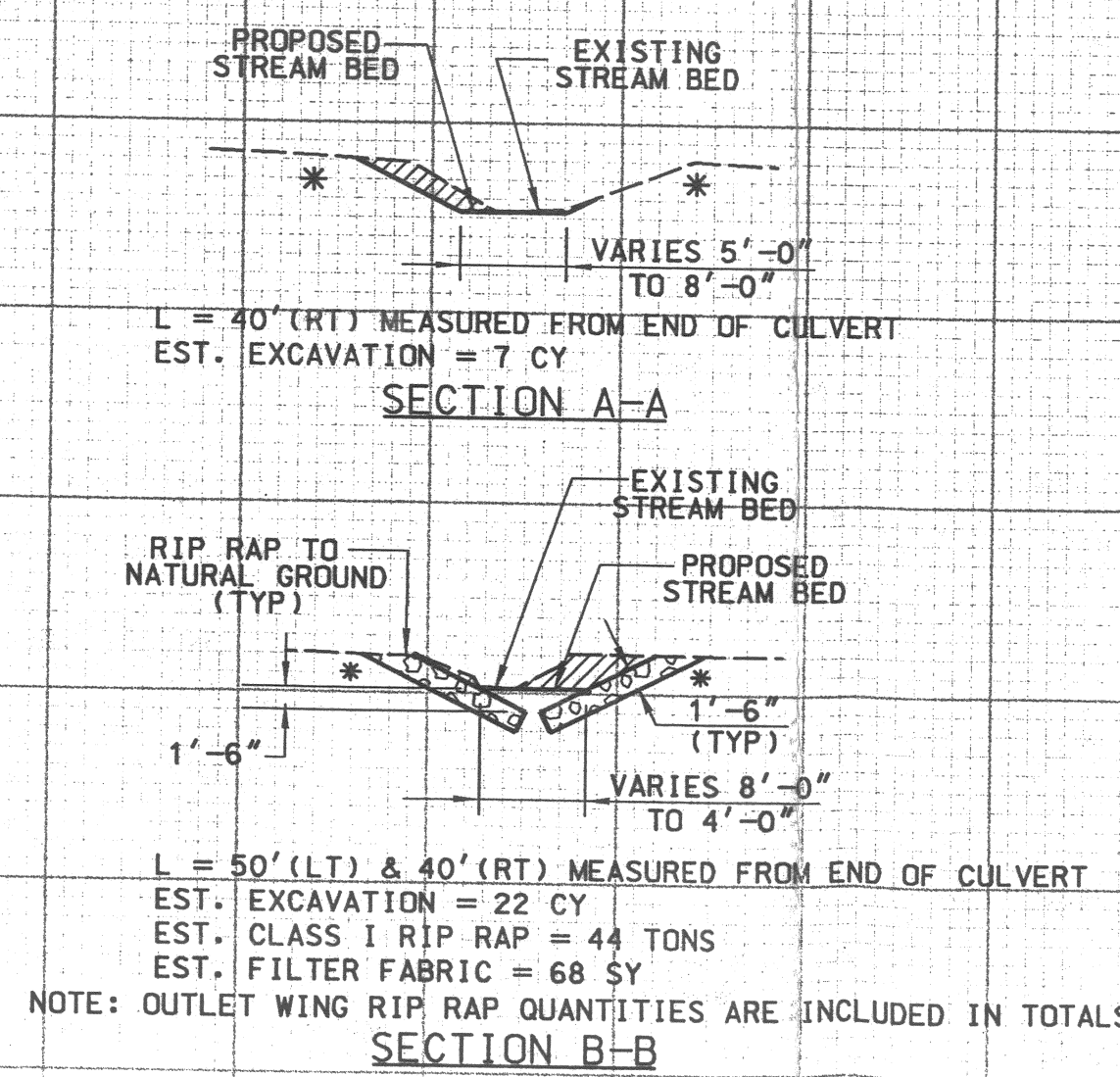
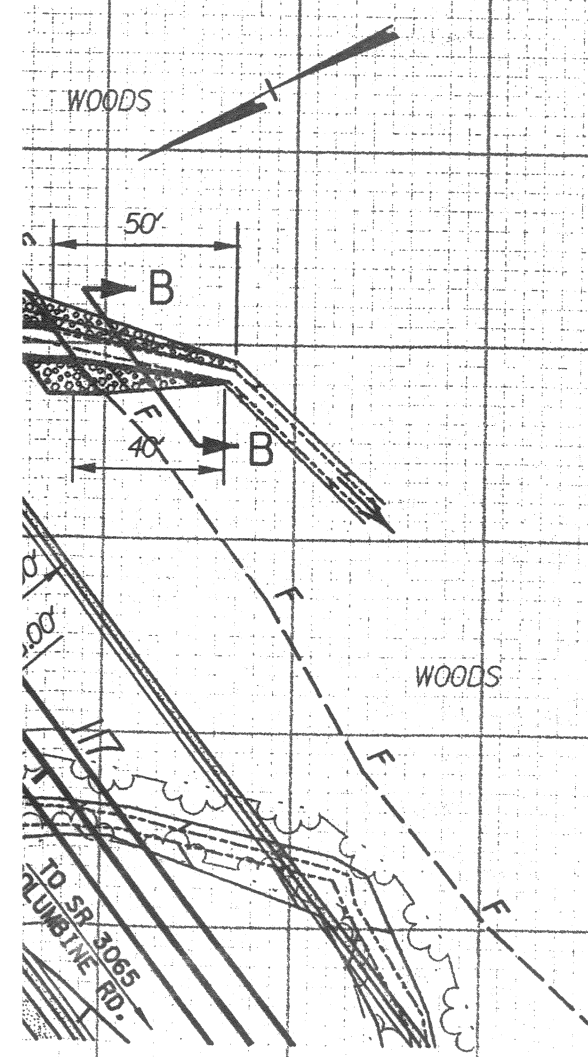
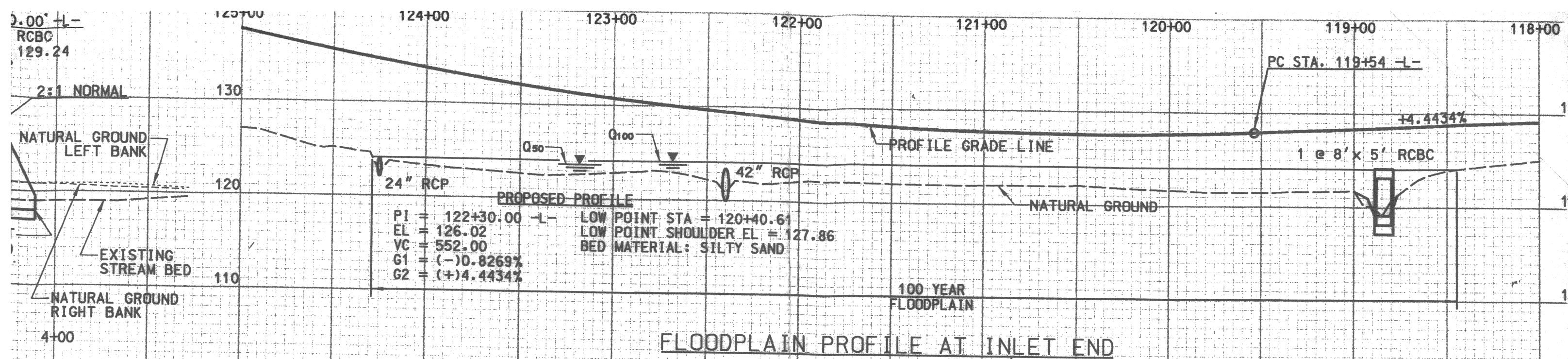
Reviewed & Approved by: Susan Payne

Date









CHANNEL EXCAVATION

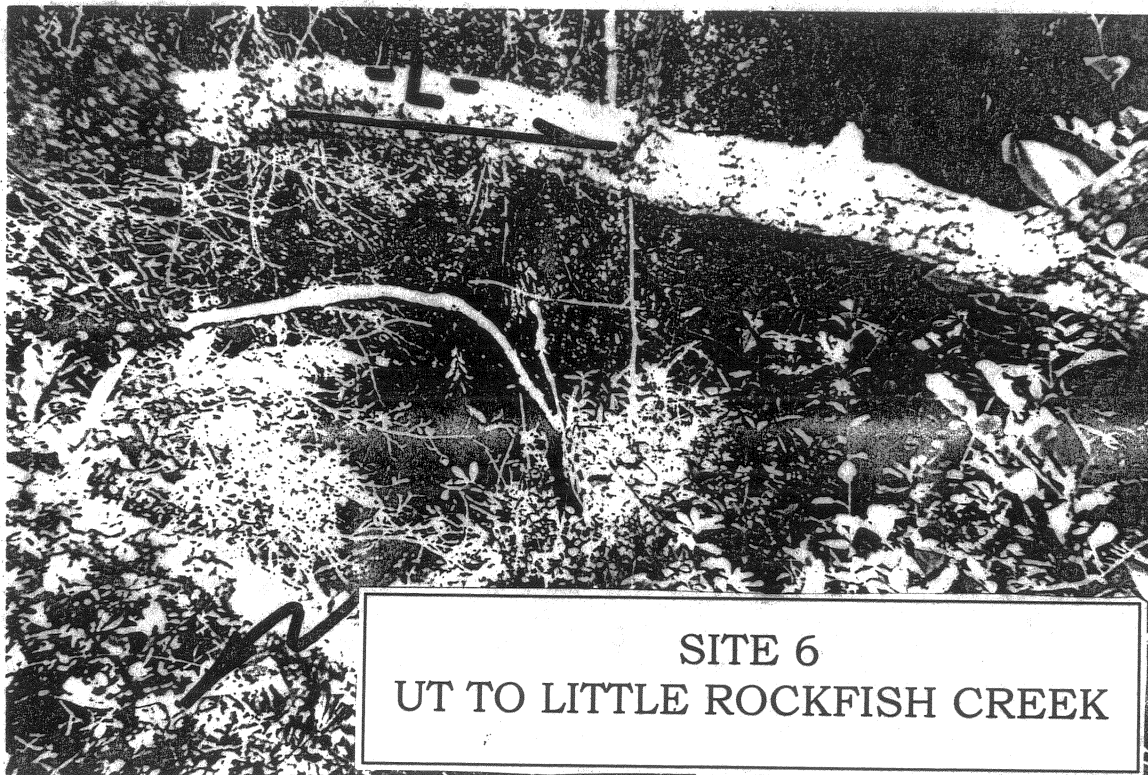
\* SIDE SLOPES VARY FROM 2:1 TO EXISTING



# CULVERT SURVEY & HYDRAULIC DESIGN REPORT

N. C. DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
HYDRAULICS UNIT  
RALEIGH, N. C.

I.D. No. U-0620 Project No. 8.1442601 Proj. Station 184+27.00 -L-  
County CUMBERLAND Stream LITTLE ROCKFISH CREEK TRIBUTARY Stru. No.  
On Highway HOPE MILLS Between SR 1005 and SR 1132  
BYPASS CAMDEN RD. LEGION RD.  
Recommended Structure 1 @ 9' x 5' RCBC WITH SIDE TAPERED INLET.  
OVERFLOW: 1 @ 36" RCP  
Recommended Location Is Up, At, Down Stream from Existing Crossing. NEW LOCATION  
Recommended Width of Roadway 76.4' (FC to FC) Skew 90°  
Bench Mark Is BM#106 R.R. SPIKE IN BASE OF 8" PINE 26.32' LT OF  
-L- STA. 193+85.93 Elev. 176.32 ft Datum: NGVD 29  
Temporary Crossing NOT REQUIRED



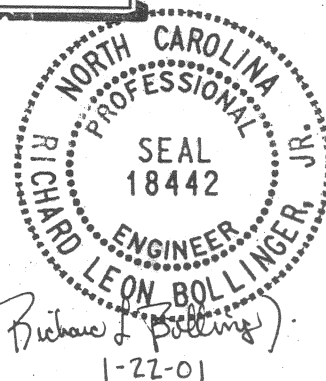
Designed by: TRAN SITE CONSULTING ENGINEERS, INC.

Assisted by: ERP, JAB, PCP

Project Engineer: RLB

Reviewed & Approved by: Susan Payan

Date



Drainage Area 0.48 Sq. Mi. Source USGS QUAD MAP Character URBAN  
 Stream Classification (Such as Trout, High Quality Water, etc.) CLASS 'B'  
 Data on Existing Structure N/A - NEW LOCATION  
 Data on Structures Up and Down Stream UPSTREAM: NO UPSTREAM STRUCTURES  
 DOWNSTREAM: CONFLUENCE WITH HOPE MILLS LAKE

Gage Station No. NONE ON STREAM Period of Records N/A  
 Max. Discharge N/A c.f.s. Date N/A Frequency N/A  
 Historical Flood Information: N/A - NEW LOCATION  
 Date Elev. ft Est. Freq. Source Period of Knowledge

\* Allowable HW Elev. 139.65 ft Normal Water Surface Elev. 135.47 ± ft

Manning's n: Left O.B. .16 Channel .08 Right O.B. .16 Obtained From FIELD OBSERVATION

Flood Study / Status NO FEMA FIS STUDY Floodway Established? NO

Flood Study 100 yr. Discharge N/A c.f.s.; W.S. Elev.: With Floodway N/A ft Without Floodway N/A ft

\* EXISTING 100 YR. WSEL + 1.0'

#### DESIGN DATA

Hydrological Method USGS REGRESSION EQUATIONS

Hydraulic Design Method HDS-5

Design Tailwater:  $Q_{10}$  5.47 ft  $Q_{25}$  — ft  $Q_{50}$  6.18 ft  $Q_{100}$  6.38 ft  $Q_{500}$  7.66 ft  
 FROM HEC-RAS, RS 1180

Size & Type	$Q_{\Delta}$ c.f.s.	Inlet Control, ft					Outlet Control, ft						Remarks
		$K_e$	Face Control		Throat Control		$d_c$	$\frac{d_c+D}{2}$	$h_o$	H	$LS_o$	H.W.	
			HW/D	H.W.f	HW/D	H.W. <sub>t</sub> $\square$							
1 @ 9'x 5'	260	.2	0.78	3.85	-	3.91	2.72	3.86	5.47	0.66	3.8	2.33	$Q_{10}$ IC (THROAT)
1 @ 9'x 5'	410	.2	1.08	5.40	-	5.26	3.67	4.34	6.18	1.64	3.8	4.02	$Q_{50}$ IC (FACE)
1 @ 9'x 5'	460	.2	1.13	5.73	-	5.71	3.95	4.47	6.38	2.04	3.8	4.62	$Q_{100}$ IC (FACE)
1 @ 9'x 5'	900	.2	1.89	9.45	-	10.06	5.00	5.00	7.66	7.49	3.8	11.35	$Q_{500}$ OC (THROAT)

△ HDS-5 COMPUTATIONS ARE BASED ON 0 (MC)

SEE ADDITIONAL INFORMATION AND COMPUTATIONS FOR FLOW DISTRIBUTION

□  $HW_t$  VALUES HAVE BEEN ADJUSTED BY  $L_1/5$

Is a Floodway Revision Required? NO

Outlet Velocity ( $V_{10}$ ) 5.49 ft/s Natural Channel Velocity ( $V_{10}$ ) 3.97 ft/s  
 @ RS 1186

Required Outlet Protection CLASS "I" RIP RAP ON BANK AS SHOWN

#### INFORMATION TO BE SHOWN ON PLANS

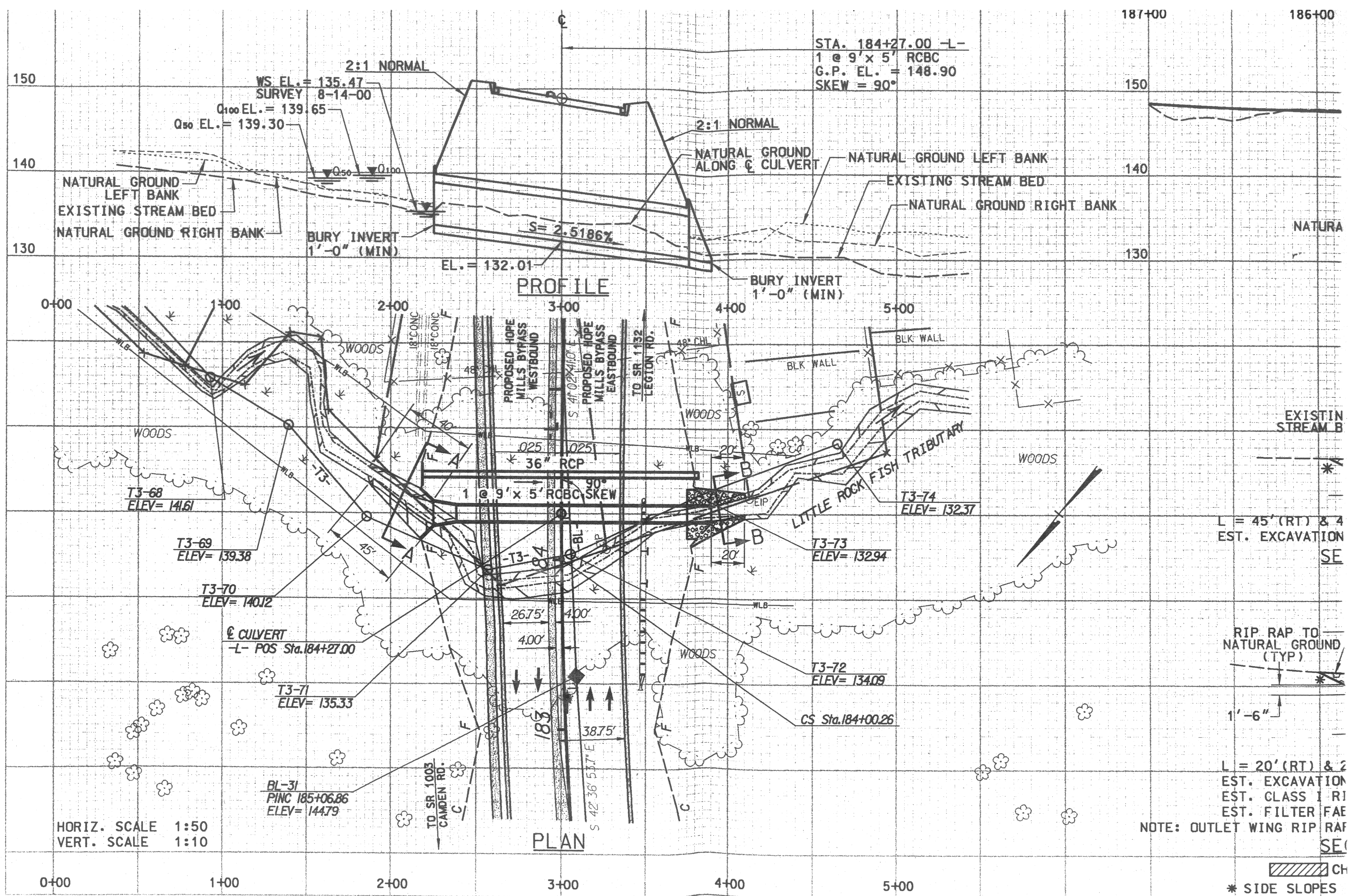
Design: Discharge 410 c.f.s. Frequency 50 YR. Elev. 139.30 ft

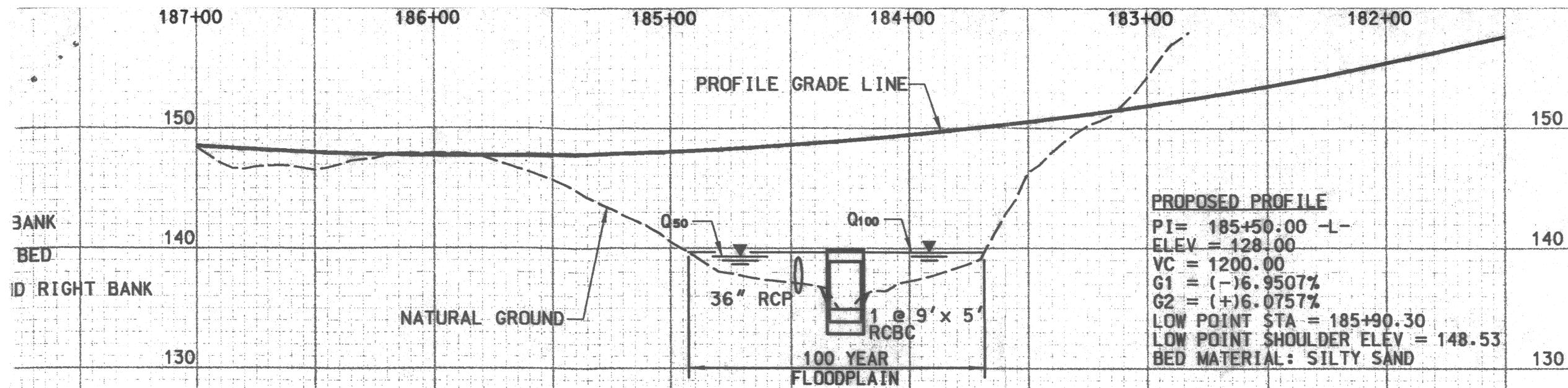
Base Flood: Discharge 460 c.f.s. Frequency 100 YR. Elev. 139.65 ft

Overtopping: Discharge \*\* c.f.s. Frequency > 500 YR. (+) Elev. 148.70 ft

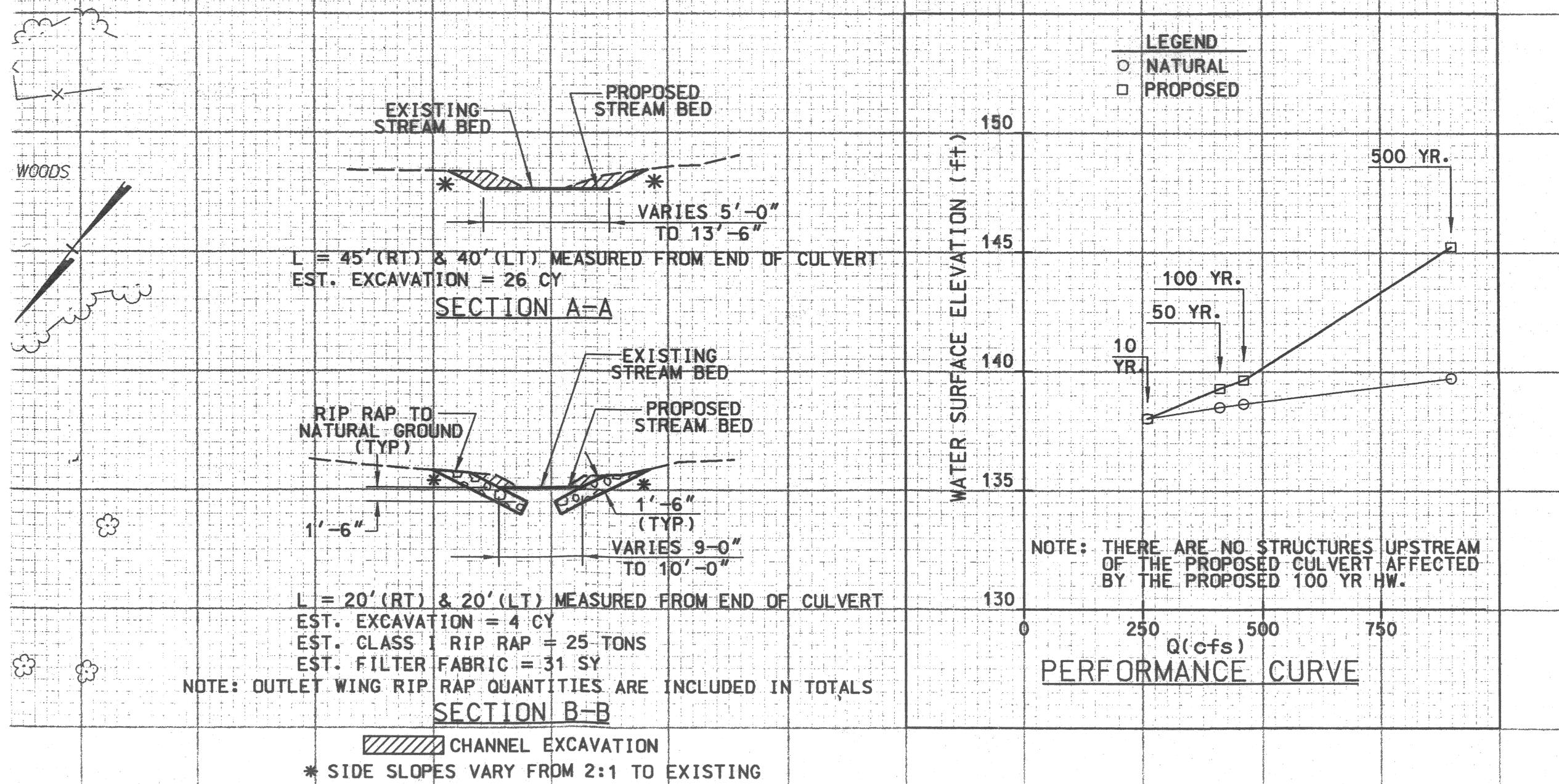
\*\* OVERTOPPING FLOOD IS GREATER THAN THE 500 YR. FLOOD







### FLOODPLAIN PROFILE AT INLET END



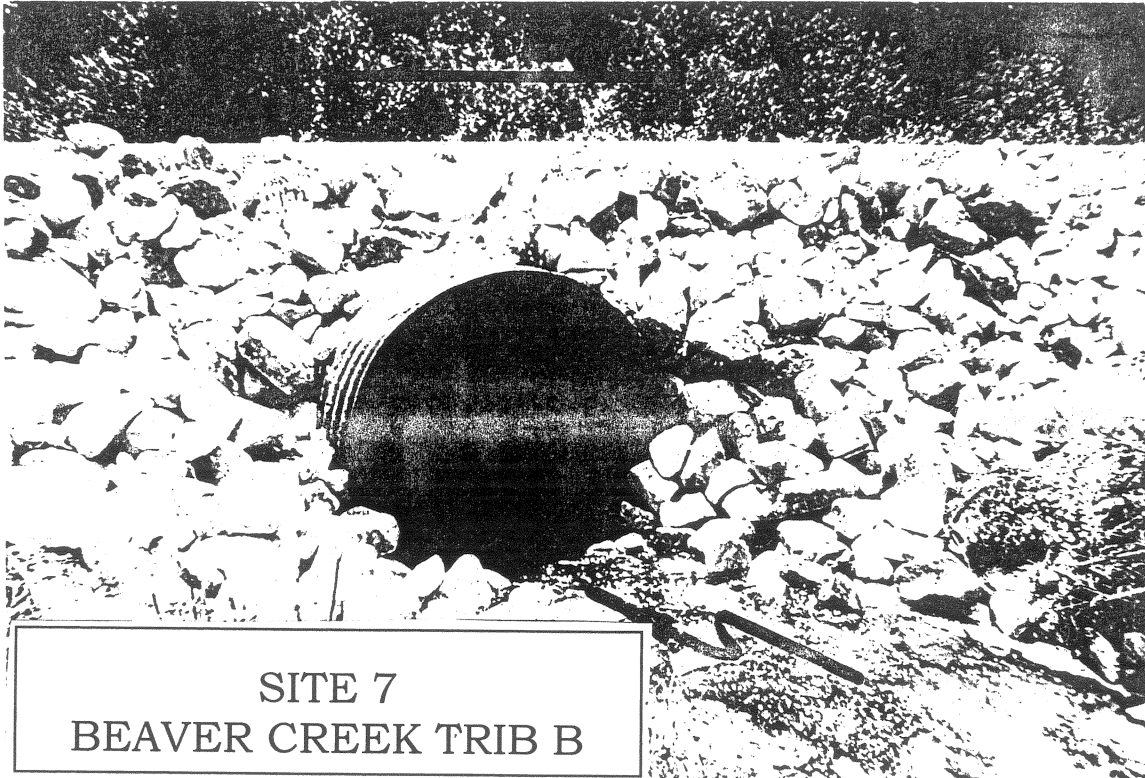


# CULVERT SURVEY & HYDRAULIC DESIGN REPORT

N. C. DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
HYDRAULICS UNIT  
RALEIGH, N. C.

MC

I.D. No. U-0620 Project No. 8.1442601 Proj. Station 15+74.00 -Y2-  
County CUMBERLAND Stream BEAVER CREEK TRIBUTARY B Stru. No.  
On Highway SR 1107 Between SR 1141 and SR 1108  
FISHER RD. BINGHAM DR./CUMBERLAND RD. LAKEWOOD DR.  
Recommended Structure 1 @ 9' x 5' RCBC  
Recommended Location is Up, (At) Down Stream from Existing Crossing. EXISTING LOCATION  
Recommended Width of Roadway 46.0' (SP TO SP) Skew 70°  
Bench Mark is BM#100 CUT IN CONC. ON BRIDGE END BENT 50.52' LT OF  
-L- STA. 32+54.64 Elev. 125.63 ft Datum: NGVD 29  
Temporary Crossing NOT REQUIRED



SITE 7  
BEAVER CREEK TRIB B



Designed by: TRAN SITE CONSULTING ENGINEERS, INC.  
Assisted by: ERP, JAB, PCP  
Project Engineer: RLB  
Reviewed & Approved by: Susan Payne Date



**APPENDIX D**  
**FEMA Compliance Letter**



## Federal Emergency Management Agency

Washington, D.C. 20472

JUL 22 2002

RECEIVED

JUL 24 2002

Mr. James E. Martin  
Cumberland County Manager  
P.O. Box 1829  
117 Dick Street, Suite 512  
Fayetteville, North Carolina 28302

## IN REPLY REFER TO:

Case Number: 02-04-275R DIVISION OF HIGHWAYS HYDRAULICS UNIT

Community Name: Cumberland County,  
North Carolina  
(Unincorporated Areas)

Community Number: 370076

(104)

U-620

CUMBERLAND CO.

Dear Mr. Martin:

This letter is in reference to a March 14, 2002, letter from Mr. Robert N. Stanger, P.E., Cumberland County Engineer, requesting a conditional Letter of Map Revision (LOMR) for the proposed Hope Mills Bypass Highway Project along Buckhead Creek. The proposed project, which will be located approximately 1,800 feet upstream of Camden Road, will consist of the placement of two 10' x 13' concrete box culverts and two 72" diameter reinforced pipe culverts and associated fill. The area of the proposed project is shown on Cumberland County Flood Insurance Rate Map (FIRM) number 370076, panels 0155 B and 0190 B, both dated February 17, 1982.

We received the following technical data, prepared by Transite Consulting Engineers, Inc. (TCE), on behalf of the North Carolina Department of Transportation (NCDOT), unless otherwise noted, in support of this request:

- a project report, titled Bridge Survey & Hydraulic Design Report, dated December 20, 2001, showing the plans for the proposed project;
- a HEC-RAS project, dated December 19, 2001, for Buckhead Creek, containing the following nine plans:
  - one of the 10% (10-year), 2% (50-year), and 1% (100-year) annual chance floods, one of the 0.2% annual chance (500-year) flood, and one of the 1% annual chance flood and floodway, emulating the HEC-2 hydraulic model used to prepare the August 17, 1981, Flood Insurance Study (FIS) for Cumberland County;
  - one of the 10%, 2%, and 1% annual chance floods, one of the 0.2% annual chance flood, and one of the 1% annual chance flood and floodway, reflecting existing conditions; and
  - one of the 10%, 2%, and 1% annual chance floods, one of the 0.2% annual chance flood, and one of the 1% annual chance flood and floodway, reflecting proposed conditions.
- an undated, topographic workmap, titled Topographic Workmap, certified December 20, 2001, at a scale of 1"=400', with various contour intervals, annotated to show the effective and proposed conditions 1% and 0.2% annual chance floodplains

and floodway for Buckhead Creek, and showing the cross-section locations used in the aforementioned HEC-RAS hydraulic analyses;

- a design report, titled Hydraulic Design Report and Floodway Revision for Structure Carrying Proposed Hone Mills Bypass over Buckhead Creek, dated December 20, 2001, containing an evaluation of alternatives to the proposed project that would not cause increases in 1% annual chance water-surface elevations, stating why these alternatives are not feasible;
- copies of letters, all dated March 15, 2002, sent to all affected property owners, notifying them of the proposed increases in flood hazards on their property;
- an undated document, titled Additional Documentation required by MT-2 Forms, certified on June 10, 2002, by Mr. Richard L. Bollinger, Jr., P.E., of TCE, certifying that no structures are located in areas that would be impacted by the proposed increases in flood hazards due to the proposed project; and
- completed application/certification forms, including community concurrence with this request.

We received all data necessary to process this request by June 14, 2002.

To determine the changes in flood hazards that will be caused by the proposed project, we compare the hydraulic modeling reflecting the proposed project (referred to as the proposed conditions model) to the hydraulic modeling used to prepare the FIS (referred to as the effective model). If the effective model does not provide enough detail to evaluate the effects of the proposed project, an existing conditions model must be developed to provide this detail. This existing conditions model is then compared to the effective model and the proposed conditions model to differentiate increases or decreases in flood hazards caused by more detailed modeling from increases or decreases in flood hazards that will be caused by the proposed project.

The existing conditions model used seven more cross sections than the effective model. When compared to the effective model, the existing conditions model reflects increases and decreases in 1% annual chance water-surface elevations, with a maximum increase of 0.7 foot at a point approximately 1,800 feet upstream of Camden Road and a maximum decrease of 0.3 foot at a point approximately 4,700 feet upstream of Camden Road.

When we compared the existing conditions model to the proposed conditions model, we determined that the proposed project will cause increases and decreases in 1% annual chance water-surface elevations, with a maximum increase of 0.62 foot at points approximately 2,100 and 2,200 feet upstream of Camden Road and a maximum decrease of 0.21 foot at a point approximately 4,700 feet upstream of Camden Road.

We have reviewed the submitted data and determined that the proposed project meets the minimum floodplain management criteria of the National Flood Insurance Program (NFIP). If the project is built as proposed, a revision to the FIS and FIRM for your county will be warranted. This revision will show increases and decreases in 1% annual chance water-surface elevations, narrowing of the 1% annual chance floodplain and the addition of a floodway between Camden Road and State Road 1137, as shown by the aforementioned data. The 1% annual chance water-surface elevations will increase by a maximum of 1.2 feet at a point approximately 1,800 feet



upstream of Camden Road and decrease by a maximum of 0.5 foot at a point approximately 4,700 feet upstream of Camden Road. The 1% annual chance floodplain will narrow by a maximum of 550 feet at a point approximately 1,700 feet upstream of Camden Road. Future revisions to the FIS and FIRM, or restudies of the flood hazards in this area, could modify this determination. The Federal Emergency Management Agency (FEMA) provided your county with a Flood Boundary and Floodway Map (FBFM) for informational purposes. Since the FBFM for your county was not published by FEMA, it is not considered to be effective information. For this reason, the floodway published as part of the revision in follow-up to this conditional LOMR will be shown on the FIRM.

We based this determination on the 1% annual chance discharges published in the August 17, 1981, FIS for the unincorporated areas of Cumberland County. We have not considered changes in watershed conditions that may have occurred since the publication of the unincorporated areas of Cumberland County FIS and that may have increased discharges. Additionally, future development of projects upstream of the subject area could change watershed conditions and increase discharges. A comprehensive restudy of your county's flood hazards will consider any changes to flood hazard conditions subsequent to the publication of the FIS for your county, and the flood hazards shown in the FIS and FIRM could be increased.

Your county must approve all proposed floodplain development, including this proposed project, and ensure that permits required by other Federal agencies and/or State and local agencies have been obtained. State and/or county officials may set standards for construction that are more restrictive than the minimum NFIP standards or may limit development in floodplains, based on knowledge of local conditions and in the interest of safety. If the State of North Carolina and/or Cumberland County have adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

During our review, we identified the following concern with the submitted map, titled Topographic Workmap:

- the labels indicating the elevation for several contour lines are not legible; and
- the delineations of the 1% and 0.2% annual chance floodplains on the submitted map do not appear to accurately depict the floodplains when compared to the contour lines presented on the map.

In addition, you should require full resolution of the aforementioned concerns before approving any construction within the floodway or floodway fringe, which is the area between the floodway and the 1% annual chance floodplain boundaries. We will not revise the FIS and FIRM for the unincorporated areas of Cumberland County to reflect the effects of the completed Hope Mills Bypass Highway Project until these concerns are resolved.

When your county requests a map revision to reflect the effects of the completed project, you must submit either a copy of a public notice stating the county's intent to revise the floodway on the FIRM or a statement by the county that it has notified all affected property owners and affected jurisdictions of the revision to the floodway, in compliance with NFIP regulations Subparagraph 65.7(b)(1).

NFIP regulations Section 65.3 states that when a community's Base (1% annual chance) Flood Elevations (BFEs) increase or decrease because of physical changes that affect flooding conditions,



the community must submit technical or scientific data to FEMA that substantiate these changes. The community must submit such data as soon as possible, but no later than 6 months after such data become available, so that FEMA can base flood insurance premium rates and floodplain management requirements on the most up-to-date and accurate information available.

Culverts will fail to function as designed without proper maintenance, such as the regular clearing of the culvert. To avoid such failures, we require participating communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained according to NFIP regulations Subparagraph 60.3(b)(7). Therefore, upon completion of the project, your county must submit documentation ensuring that the culverts will be maintained to preserve their design function. We may request that your county submit a description and schedule of its culvert maintenance, as outlined in Subparagraph 65.6(a)(12) of the NFIP regulations.

Your county must meet the criteria of NFIP regulations Subparagraphs 65.5(a)(4) or 65.6(a)(14), which require that the county's NFIP permit official or any county official having authority for floodplain management, provide written assurance that the community has complied with the appropriate minimum floodplain management requirements under NFIP regulations Section 60.3, which includes the requirements that:

- residential structures built or substantially improved in the 1% annual chance floodplain have their lowest floor elevated to or above the BFE;
- the participating community has determined that the land and any existing or proposed structures to be removed from the 1% annual chance floodplain are reasonably safe from flooding and that the community has on file, available upon request, all supporting analyses and documentation used to make that determination;
- the participating community has issued permits for all proposed construction or other proposed development; and
- all necessary permits have been received from those governmental agencies where approval is required by Federal, State, or local law.

We remind you of the elevation and floodproofing requirements contained in NFIP regulations Subparagraphs 60.3(c)(2) through (4). These requirements apply to the construction of new residential and nonresidential structures, as well as to the substantial improvement of existing structures, located within the 1% annual chance floodplain. In accordance with Subparagraphs 65.5(a)(3) and 65.5(a)(4)(i), for a structure to be removed from the 1% annual chance floodplain, the lowest adjacent grade (the lowest ground touching the structure) of the structure must be at or above the BFE, and a completed community acknowledgment form must be submitted, which is FEMA's assurance that all appropriate Federal, State, and local requirements regarding the fill placement have been met.

Instead of issuing a LOMR, we may incorporate the effects of the completed project into the FIS and FIRM through a physical map revision, which entails revising and republishing the FIS and FIRM. A physical map revision, because it involves preparing preliminary versions of the revised FIS and FIRM for community review, takes considerably longer than the issuance of a LOMR; however, a physical map revision provides due process to property owners who may be affected by increased BFEs, 1% annual chance floodplains, or floodways.

Upon completion of the proposed project, your county should request a revision to the FIS and FIRM. The revision request should be submitted to our Regional Office in Atlanta, Georgia, and include the data listed below.

1. Evidence of compliance with NFIP regulations Paragraph 65.4(b), which states that "all requests for changes to effective maps . . . must be made in writing by the community's Chief Executive Officer (CEO) or an official designated by the CEO. Should the CEO refuse to submit such a request on behalf of another party, we will agree to review the request only if written evidence is provided indicating the CEO or designee has been requested to do so."
2. As-built plans of the project, certified by a registered professional engineer.
3. HEC-RAS hydraulic models of the 10%, 2%, 1%, and 0.2% annual chance floods and floodway, representing as-built conditions. The elevations in the as-built conditions HEC-RAS hydraulic models must coincide with the FIS elevations at the upstream and downstream ends of the project.
4. Water-surface profiles of the 10%, 2%, 1%, and 0.2% annual chance floods, reflecting as-built conditions.
5. Delineation of the 1% and 0.2% annual chance floodplains and floodway, and the locations and alignment of the cross sections and stream centerline (flood profile baseline) used in the hydraulic models.
  - a. Please show this information on a certified map of suitable scale and topographic definition to provide reasonable accuracy.
  - b. Label all items for easy cross-referencing to the hydraulic model and summary data.
6. Copies of the unincorporated areas of Cumberland County FIRM number 370076, panels 0155 B and 0190 B, both dated February 17, 1982, annotated to show the as-built conditions 1% and 0.2% annual chance floodplain and floodway boundaries for Buckhead Creek.
7. Evidence of compliance with NFIP regulations Subparagraphs 65.7(b)(1) and 65.6(a)(12), regarding floodway notification and culvert maintenance, respectively, as previously discussed.
8. Evidence of notification to the property owners impacted by the increases in the 1% annual chance water-surface elevations and the addition of a floodway along Buckhead Creek. Property owner acceptance of these increases is required for the LOMR to become effective on the date of issuance.

If the project is built as proposed, you do not have to resubmit items 3, 4, and 6; otherwise, please resubmit them. If the effects of the project are incorporated into the FIS and FIRM through a physical map revision, you do not need to submit property owner acceptance because

the physical map revision process includes a comment period during which property owners can submit their concerns about the revision of the FIS and FIRM.

We have enclosed a copy of our application/certification forms for your reference. Typically, we do not require these forms if the project is completed as proposed. The enclosed document, titled Requirements for Submitting Application/Certification Forms to Support Requests for NFIP Map Revisions, describes in detail the circumstances under which the forms are required.

The NFIP is primarily funded by policyholders, not taxes. We recover costs associated with reviewing and processing requests for revisions to published FISs and FIRMs to minimize the financial burden on the policyholders. The fee for an as-built LOMR request in follow-up to this conditional LOMR is \$3,400, which we must receive before we can begin processing. This fee represents the current fee schedule effective June 1, 2000. Please note that the fees are subject to change, and the fee for the follow-up LOMR may change between the date of this letter and the date that the follow-up LOMR is submitted. If items 3, 4, and 6 listed above must be resubmitted, the processing fee could be higher. Your payment must be a check or money order made payable to the National Flood Insurance Program and should be forwarded to:

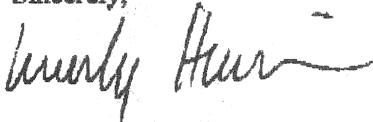
Federal Emergency Management Agency  
Fee Charge System Administrator  
P.O. Box 3173  
Merrifield, Virginia 22216

Once we receive the processing fee and the items listed above, complete our review, and verify that the completed project meets all applicable NFIP standards, we will revise your county's FIS and FIRM to incorporate the effects of the completed project, as appropriate.

Part 65 of the enclosed NFIP regulations further describes the data needed to support a request to revise a FIS and FIRM. Your compliance with the criteria outlined in the NFIP regulations will streamline our review, allowing us to expeditiously revise your county's FIS and FIRM.

If you have any questions, please do not hesitate to contact the Director, Federal Insurance and Mitigation Division of the FEMA in Atlanta, Georgia, at (770) 220-5400, or the FEMA Map Assistance Center toll free at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,



Emily Hirsch, C.F.M.  
Project Engineer  
Hazards Study Branch  
Federal Insurance and  
Mitigation Administration

For: Matthew B. Miller, P.E., Chief  
Hazards Study Branch  
Federal Insurance and  
Mitigation Administration

Enclosures

cc: Mr. Robert N. Stanger, P.E.  
Mr. Marshall Clawson, P.E., Project Engineer for NCDOT Hydraulics Unit  
Mr. Richard L. Bollinger, Jr., P.E.  
State NFIP Coordinator

**APPENDIX E**  
**Stormwater Management Plan**

State Project No. 8.1442601  
TIP Project No. U-0620  
Cumberland County, NC  
Hope Mills By-Pass from SR 1141 (Bingham Drive)  
to SR 1363 (Elk Road)

**STORMWATER MANAGEMENT  
PLAN**

Prepared by:  
TranSite Consulting Engineers, Inc.  
1300 Paddock Dr., Suite G-10  
Raleigh, NC 27609

## **PROJECT INVOLVEMENT**

The proposed project is 3.75 miles in length and will widen existing George Owen Road to a multi-lane curb & gutter facility from SR 1141 (Bingham Drive) to SR 3065 (Columbine Road). From Columbine Road, the project will continue on new location to intersect SR 1132 (Legion Road) directly across from SR 1363 (Elk Road).

The proposed project contains seven crossings of jurisdictional streams. Three of the crossings are replacements of existing crossings while the remaining four are new crossings. See Table 1 for a detailed list of the streams and proposed crossings.

**Table 1. Stream Crossings**

<b>Stream Name</b>	<b>Drainage Area (mi<sup>2</sup>)</b>	<b>Best Use Classification</b>	<b>Proposed Structure</b>
* Beaver Creek Trib. B	2.70	C	1 @ 9' x 5' RCBC
* Beaver Creek	32.60	C	1 @ 38'-0", 1 @ 64'-0", 1 @ 38'-0" PPC Girders
* Beaver Creek Overflow	N/A	N/C	1 @ 72" RCP
Buckhead Creek	8.30	C	2 @ 10' x 13' RCBC w/ 2 @ 72" RCP Overflow
UT Buckhead Creek	0.57	C	1 @ 8' x 5' RCBC
UT Buckhead Creek	N/A	N/C	1 @ 24" RCP
UT Little Rockfish Creek	0.48	B	1 @ 9' x 5' RCBC w/ 1 @ 36" RCP Overflow

\* – Replacement of Existing Crossing

UT – Unnamed Tributary

N/C – Not Classified

A review of the Environmental Assessment and Environmental Sensitivity Maps indicates that there are no High Quality Waters (HQW), Water Supplies (WS-I or WS-II) or Outstanding Resource Waters (ORW) within 1.6 km (1.0 mile) of the project study area.

Based on the Best Use Classifications of the impacted streams and the absence of river basin buffer regulations, none of the sites listed in Table 1 require "Special Consideration".

### **POTENTIAL IMPACTS**

While there are no river basin buffer regulations currently in place, the storm drainage systems are designed so that point source discharges are located a minimum of 50' from any jurisdictional stream or wetland where project constraints allow.

### **BEST MANAGEMENT PRACTICES (BMPs)**

Enhanced grass swales are used to filter runoff and dissipate velocities in the major drainage outfalls. The swales are designed with either a constant or variable base width and 3:1 side slopes. If the swales end at a wetland boundary as opposed to at a stream, they employ a "Ditch End" detail at their terminus. This detail specifies that the swale will have a minimum depth of 1' and a 3:1 rip rap slope up to natural ground. One exception to this criteria is the enhanced grass swale right of -L- Sta. 185+50. This swale is designed with 2:1 side slopes to minimize impacts and avoid taking an existing home.

For the minor outfalls that do not use enhanced grass swales, variable width base ditches with 3:1 side slopes and ditch end details are used. As with the enhanced grass swales, these variable width ditches are designed to filter stormwater runoff and ensure that velocities are non-erosive. At -L- Sta. 157+30 (Rt.), project constraints do not allow for the construction of a grass swale or variable width base ditch so a preformed scour hole is used to dissipate velocities prior to the wetland boundary.

The stormwater impacts of this project have been minimized to the greatest extent possible through the use of enhanced grass swales, variable width base ditches and preformed scour holes.

See Table 2 for a list of the BMP types, locations and specifications for the project.

**Table 2. BMP Locations / Specifications**

<b>BMP</b>	<b>Location -L- Sta.</b>	<b>Length (ft)</b>	<b>Base Width (ft)</b>
Enhanced Grass Swale	32+20 (Rt.)	220	5
Enhanced Grass Swale	32+75 (Rt.)	420	10
Enhanced Grass Swale	105+75 (Lt.)	130	20
Enhanced Grass Swale	107+00 (Lt.)	270	3
Enhanced Grass Swale	121+40 (Rt.)	100	10
Enhanced Grass Swale	121+00 (Rt.)	450	10
Variable Width Base Ditch	150+25 (Rt.)	40	2 – 10
Variable Width Base Ditch	156+10 (Rt.)	50	3 – 10
Preformed Scour Hole	157+30 (Rt.)	N/A	4
Variable Width Base Ditch	164+35 (Rt.)	40	2 – 10
UT Little Rockfish Creek	186+00 (Rt.)	127	5 – 15

### **DESIGN DETAILS**

Design details for the enhanced grass swales, variable width base ditches and preformed scour holes are shown on the Roadway Design plans.



**APPENDIX F**  
**EEP Request Letter**



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

May 4, 2004

Mr. William D. Gilmore, P.E.  
EEP Transition Manager  
Ecosystem Enhancement Program  
1652 Mail Service Center  
Raleigh, NC 27699-1652

Dear Sir:

Subject: Cumberland County. Hope Mills Bypass from SR 1141 (Bingham Drive) to SR 1363 (Elk Road).  
State Project No 8.1442601. TIP No. U-620.

The North Carolina Department of Transportation (NCDOT) sent a letter to the North Carolina Ecosystem Enhancement Program (EEP) dated February 20, 2004 requesting that the EEP provide confirmation that you are willing to provide compensatory mitigation for the subject project. In this letter, we estimated that 1,153 linear feet of jurisdictional streams and 1.5 acres of wetlands will be impacted. We have since realized that there is an additional 62 feet of stream impact and 0.85 acre of wetland impact on the project. Therefore, the stream impacts total 1,215 feet and the wetland impacts total 2.35 acres. The stream impact will be to a first order perennial stream that is a tributary to Beaver Creek [DWQ# 18-31-24-5]. The wetland impacts will be to riverine wetlands.

We request that these impacts be included in the original request sent on February 20, 2004.

If you have any questions or need additional information please call Matt Haney at (919) 715-1428.

Sincerely,

Gregory J. Thorpe, Ph.D.,  
Environmental Management Director  
Project Development & Environmental Analysis Branch

cc: Mr. John Hennessy, Division of Water Quality  
Mr. Gary Jordan, USFWS  
Mr. Travis Wilson, NCWRC  
Mr. Jay Bennett, P.E., Roadway Design  
Mr. Omar Sultan, Programming and TIP  
Mr. Art McMillan, P.E., Highway Design  
Mr. David Chang, P.E., Hydraulics  
Mr. Greg Perfetti, P.E., Structure Design  
Mr. Mark Staley, Roadside Environmental  
Mr. Terry Gibson, P.E., Division 6 Engineer  
Mr. Jim Rerko, Division 6 DEO  
Mr. David Franklin, USACE, Wilmington  
Mr. William D. Gilmore, P.E., EEP, Raleigh  
Ms. Becky Fox, USEPA  
Mr. John F. Sullivan, III, FHWA